Archaeological Test Excavations at Spider Rockshelter (CA-Teh-1432) Lower Mill Creek Canyon, California

By

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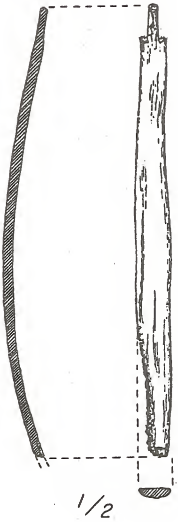


Self Bow Fragment from Payne Cave (after Baumhoff 1957: Fig. 3A, 1 and 2)

INTRODUCTION

Archaeological work in support of land managing agency actions is often fortuitous, that is, directed at an examination of archaeological remains due to other management concerns, not archaeological research interests per se. Internal funding thus comes from other activities, not "cultural". A case in point is the test excavation of CA-Teh-1432, the Spider Rockshelter located in Mill Creek Canyon (Fig. 1). This site, found during a routine archaeological survey of a parcel of Bureau of Land Management administered land, was initially considered to have indeterminate research value or significance. Test excavations were subsequently conducted to assess the research value prior to the proposed transfer of the parcel to private hands.

While project-related assessments are not the scientific ideal, they still can produce information relevant to understanding aspects of the regional prehistoric culture(s) while being responsive to public needs and agency direction. This is especially so if the investigations are conducted within the framework of a well-conceived regional research design. Such a design was prepared in anticipation of the testing program and in hopes of aiding future researchers (Appendix 1). Of course, there must be a certain level of archaeological data available as obtained through an informative sample.

In attached Appendix 1, a brief discussion is presented regarding previous regional archaeological research. In addition, the theoretical bias of the author is discussed. While the research design is ambitious in terms of expected (actual) recovery, it serves not only for answering a number of questions regarding prehistoric use in the region, but also as a format for further regional archaeological work.

The approach taken in this report is traditional, discussing artifacts by general class and, as appropriate, type with individual discussion on features, faunal and floral remains, special analyses (i.e., obsidian, sediments), etc. This report is not, of course, intended as the final word on the regional archaeology. It is a descriptive-interpretive report directed primarily at the scientific community. It's main value, hopefully, is the information provided regarding similarities and differences between use of one of the smaller or secondary prehistoric occupation sites and occupation and use of the larger contemporaneous rockshelters and open villages in the Mill Creek Canyon region.

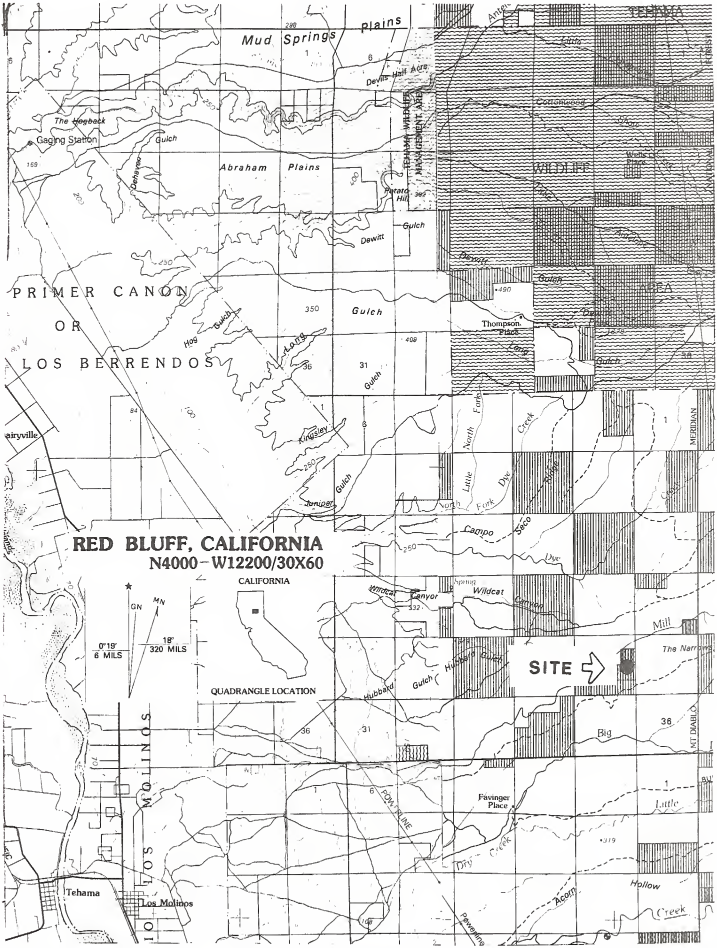
Materials recovered during this project are temporarily curated at the Bureau of Land Management office in Redding pending transfer to California State University, Sacramento.

ACKNOWLEDGEMENTS

A number of individuals assisted in the testing and other phases of this limited operation. Excavations were conducted under the author's direction with the assistance of Karen Austin, Julie Krieger, Howard Matzat, Elaine Sundahl, Trudy Vaughan and Jim Wolff. Special studies were conducted by Dwight Simons (faunal), Elena Nilsson (debitage), Tom Origer (obsidian hydration), and Richard Hughes (x-ray fluoresence). Francis Berg, Greg Greenway, Wayne King, and William Olsen provided useful comments on the draft. Patty Cook ably helped in the manuscript word processing and some of the illustrations. Other illustrations were completed by Carol Farber and Louis Wacker. Any site report is a multi-person effort. All who helped the author are graciously thanked. Any shortcomings rest with the principal writer.

Fig. 1

LOCATION MAP



SCALE 1:100 000

Bone Pendant from Payne Cave (after Baumhoff 1957: Fig. 2r)

LOCAL ENVIRONMENT

The Spider Rockshelter is situated at 1160 feet (350 m) in elevation within the lower reaches of Mill Creek Canyon in Tehama County (actually within a secondary canyon below the south main canyon rim) (Fig. 2). In a broader sense, this location is within the western slopes of the southern Cascade Mountains. A detailed environmental discussion of the general area has been presented by Wiant (1981). Only a summary presentation is offered here.

Geologically, the Tuscan formation covers the lower Mill Creek Canyon region consisting of numerous layers of volcanic lava and mud flows, or zones of basalt, tuff and agglomerate differentially eroded by Mill Creek and its secondary drainages (MacDonald 1966:71). The shelter itself probably formed either by erosion from percolating waters within the breccia or agglomerate underlying the shelter's basaltic cap or by pre-occupation lateral stream erosion of the less dense agglomerate.

Surface water near the rockshelter is seasonally (middle fall to late spring) available in the adjoining secondary stream. Nearby are a number of year-round springs and seeps. Mill Creek dominates the hydrology, being a major permanent stream situated 650 m to the northwest of the site.

Temperatures in the lower elevations of the canyon range from summer highs of greater than 100 degrees F. to winter lows of 20 degrees to 30 degrees F. with annual averages of 50 degrees to 55 degrees F. (Wiant 1981:10). Average annual precipitation, falling mostly in the late fall until mid-spring times, averages about 20-25 inches.

The principal vegetation community dominating the lower canyon reaches is the Chaparral-Interior Live Oak zone which includes the Interior Live Oak phase of the Foothill Woodland subdivision of the Oak Grassland province, and the <u>Ceanothus</u> and Scrub Oak Chaparral types of the Chaparral province. There is some mixing of this zone in a mosaic fashion with elements of the Oak Grassland zone (Munz and Keck 1959; Barbour and Majors 1977). In addition, there are riparian belts along the principal drainages (like Mill Creek and the secondary stream next to the shelter) that include willow, wild grape, bay laurel, alders and cottonwoods.

Wildlife composition is diverse and the present day distribution and density of many species is significantly different from the past (Wiant 1981:36). Consequential numbers of species were present in the general area. Among those local animals known to have been important food sources to the Yana are various rodents including the Beechey ground squirrel, beaver and various mice and rats; waterfowl, other mammals like the black-tailed hare ("jackrabbit"), racoons, and deer, and various fish species including the salmon, trout, lamprey, suckers and squawfish.

FIGURE 2

a. View westerly of Spider Rockshelter (CA-Teh-1432) during January excavations.

b. View northerly of Spider Rockshelter (CA-Teh-1432) during excavations. Wet screening occurred in creek bed to right where individuals are setting up the operation.

c. Completion of Unit 2 showing shallow (10 cm) shelter rock floor to left and deeper (50 cm) apron or talus deposit to the right.

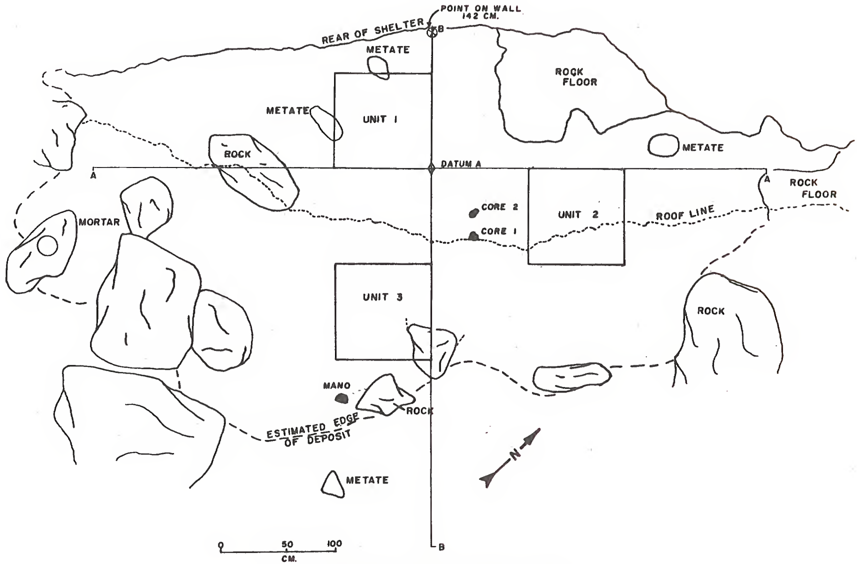
Fig. 2

a

b

c

The rockshelter itself is situated on the south side of Mill Creek Canyon between Tenmile and The Narrows, but on the northerly escarpment of a side canyon (Figure 1). The small shelter is about two meters deep and eight meters long with a height of about one meter and a half. Extending beyond the drip line in front of the southeasterly facing shelter is an apron or midden-sediment talus (Figs. 3 and 4).

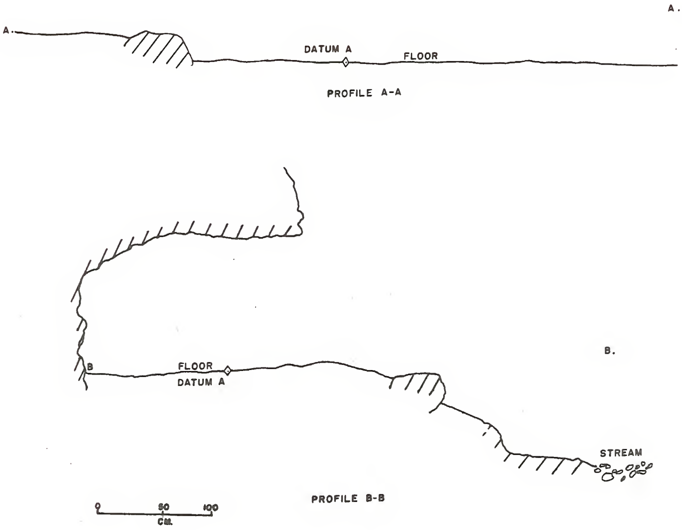


SPIDER ROCKSHELTER

(CA-Teh-1432)

Fig. 3

Fig. 4



SPIDER ROCKSHELTER

(CA-Teh-1432)

EXCAVATION STRATEGY

Initially, a site map was produced utilizing a staff compass and tape measure. Datum A was established near the center of the rockshelter, and a one-meter grid was imposed on the site running northwest-southeast. A secondary, more permanent datum (B) was established on the rear wall of the rockshelter northwest 142 cm from Datum A (Fig. 3).

Two 1m x 1m units were arbitrarily laid out, one (Unit 1) in the middle of the shelter and one (Unit 2) toward the northerly end in a deep-looking section halfway under the roof but including part of the midden apron (Fig. 2c). Time permitted the partial excavation of a third 1m unit totally within the shelter apron. This spacing provided what seems to be well-distributed coverage of the existing deposit. It is estimated that approximately 15% of the deposit was excavated.

Excavations were conducted with a trowel, whisk broom, and dust pans, with materials placed in buckets and removed to the screens. Arbitrary 10 cm ground contour levels were used. Unit 1 reached 20 cm, Unit 2 bottomed out at 50 cm, and Unit 3 was stopped at 20 cm before reaching sterile.

Units 1 and 2 were screened with 3.0 mm (1/8") mesh. One-quarter of each unit was wet screened using water from the adjoining stream. Material from 20 cm to 50 cm in a deep pocket in Unit 2 was all wet screened by level. One-quarter of Unit 3 was wet screened using 3.0 mm (1/8") mesh, while the remainder of the first level was screened with 6.0 mm (1/4") mesh. Only one-fourth of the unit was excavated to 20 cm due to the presence of a burial and time constraints.

Regular screening was difficult due to the moisture content of most of the midden. Considerable brushing, troweling and drying of material in the screen was necessary before cultural materials were evident. The wet screening was advantageous only to a point as it was necessary to sort cultural materials while the screen residue was still wet owing to the cool winter (January) conditions and time limitations. It was especially difficult to find the small obsidian flakes when all dark-colored pebbles were "glossy" in appearance. In effect, the recovery almost certainly has some bias because of the conditions discussed above.

SEDIMENTS-STRATIGRAPHY

Two basic strata characterize the rockshelter deposit, an upper stratum of nearly sterile, silty clay loam and a lower stratum of friable, gravelly loamy midden trending with depth within the shelter apron toward a gravelly sandy loam. The upper stratum is present predominantly within the western end of the shelter representing materials moved in from upslope by sheetwash activities, possibly an outcome of historic over-grazing. The surrounding contributing soil is a Toomes, very rocky loam (Gowans 1967). The main deposit contains numerous angular, sub-angular and rounded pebbles and cobble-size rocks (ca. 30%), some that may be culturally introduced (heating stones) and some representing volcanic agglomerate roof fall (see Fig. 3c).

The deposit ranges in pH from neutral to moderately alkaline (Table 1). The phosphorus content is highest, as would be expected, within the ash lens and ashy area of deposit and in the middle sediments. Readings within the surface and basal levels of Unit 2 are relatively low indicating pre and post occupational sediments mixed extensively with cultural deposits, far less the case in the middle deposits (Table 1). Overall readings indicate considerable but confined human use of the shelter.

There is some evidence of rodent disturbance within the shelter and fine rootlets have penetrated to bedrock. Thus, it would appear that a certain unspecified level of deposit mixing has occurred. Considering the shallow nature of the deposit (20 - 50 cm), any stratigraphic differences in the remains of culture activities must be cautiously viewed.

TABLE 1
SEDIMENT ANALYSIS - CA-Teh-1432

	Soil Color	pH	% Sand	% Silt	% Clay	P (ppm)
Unit 1						
0 - 10 cm	7.5 YR 5/4 - brown (dry) 5 YR 3/3 - dark reddish br.(moist)	8.2	7.3	60.0 (silty clay loam)	32.7	38
10 - 20 cm	10 YR 4/2 - dark grayish br.)dry)	8.3	38.3	30.0 (clay loam)	31.7	63
Unit 2						
0 - 10 cm	10 YR 4/2 - dark grayish br.(dry)	6.9	48.3	31.7 (loam)	20.0	13
Ash lens	10 YR 7/2 - light gray (dry)	8.2	38.3	45.0 (loam)	16.7	25
20 - 30 cm	10 YR 4/3 - brown (dry)	7.0	40.0	53.3 (silt loam)	6.7	38
40 - 50 cm	10 YR 3/2 very dark grayish br. (dry)	7.1	52.0	44.7 (sandy loam)	3.3	13

BONE TOOL

The tip of a bone pin or awl was recovered from Unit 1, 0 - 10 cm. The tip exhibits striations running around the specimen perpendicular to the tool's axis. This suggests wear from a twirling or twisting motion such as might be expected during basketry manufacture.

GRINDING-MILLING TOOLS

Manos

Three oblong andesite manos were recovered from the rockshelter. All are single-hand size and appear to be unshaped alluvial or volcanic agglomerate derived (Table 2). Each exhibits pecking or battering on the ends. Wear facets are convex on two and flat on one. One mano is somewhat wedge shaped. Striations are not readily apparent on these specimens. On one face of the smallest specimen (214-83) there is ochre staining. Two of the specimens are illustrated in Figs. 5a and 5b.

Metates

Four andesite metates or milling blocks were discovered at the rockshelter, three on the surface and one subsurface in Unit 1. All are unshaped small boulder blocks with flat or slightly concave milling surfaces. The three unifacial specimens on the surface were turned wear-face downward. The Unit 1 artifact is bifacial. Measurements are included in Table 2 and select photographs presented in Figs. 6b and 6c.

Mortar

An andesite boulder (non-portable) at the edge of the rockshelter contains a hopper mortar hole which measures 17 cm in diameter and four cm deep (Fig. 6a).

Johnson (1984:189-207) has discussed in detail various milling stone artifacts from sites in the southern Cascades. Those recovered from Spider Rockshelter fall within his common categories. No pestles were recovered despite the nearby mortar hole. But, pestles are not nearly as frequent as manos in the area (Johnson 1984:192, 195). And use of a wooden pestle is unlikely judging from the ethnographic record (also see Johnson 1984).

Johnson (1984:198) has presented a list of traits regarding milling implements in the general area. Data from CA-Teh-1432 generally agree with Johnson's observations. For instance, shaped milling implements as opposed to those found at Spider Rockshelter are found primarily in hypothesized winter villages. This corresponds with the presumed secondary camp function ascribed to this site, an obvious assumption considering site size.

TABLE 2
Grinding Tool Characteristics

Cat. #	Location	Tool Type	Ln. (cm)	Wd.	Th.	Material	No. Faces	Remarks
214-26	Unit 2, 0-10	Mano	12.9	8.0	6.3	Andesite	2	Unshaped, ends battered
214-83	Surface	Mano	8.6	6.8	3.8	Andesite	2	Unshaped, ends pecked, ochre
214-15	Unit 1, 0-10	Mano	?	9.7	6.0	Andesite	1	End battered
214-16	Unit 1, 0-10	Metate	33.0	24.0	9.0	Andesite	2	Unshaped, flat
214-86	Surface	Metate	32.5	27.0	5.4	Andesite	1	Unshaped, slightly concave
No. #	Surface	Metate	50.0	29.0	16.0	Andesite	1	Unshaped, flat
No. #	Surface	Metate	42.0	37.0	16.0	Andesite	1	Unshaped, flat

FIGURE 5

Manos

a.	214-26	Unshaped, bifacial andesite mano
b.	214-83	Unshaped, bifacial andesite mano with ochre staining

Fig. 5

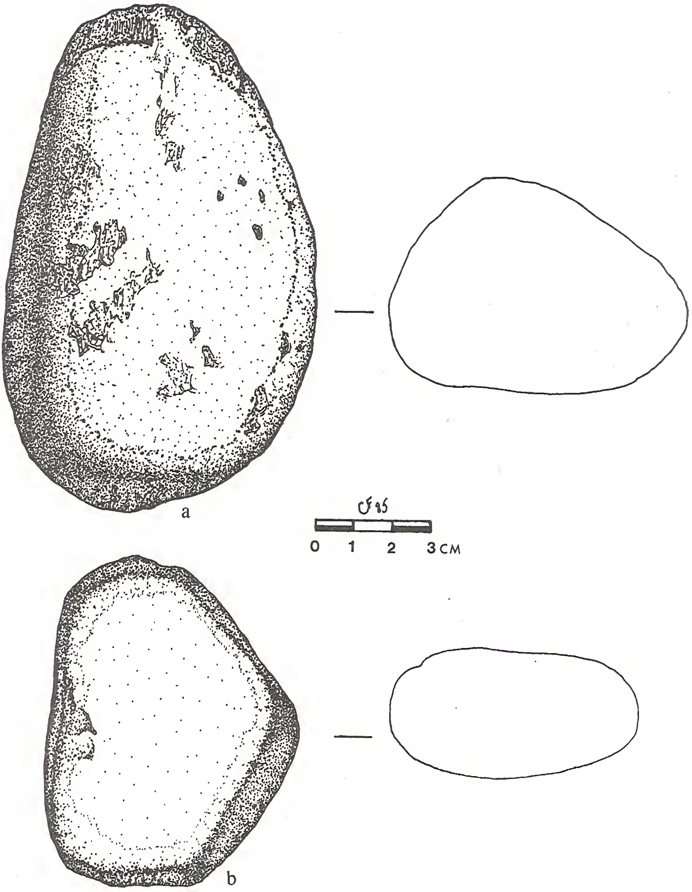


FIGURE 6

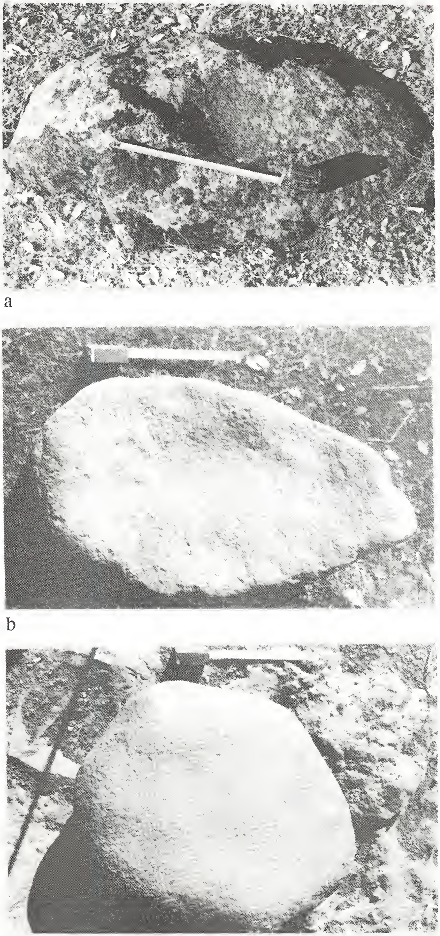
Milling Tools

a. Bedrock hopper mortar at edge of rockshelter deposit.

b. Unnumbered, unshaped unifacial andesite metate from surface of rockshelter (not collected).

c. Unnumbered, unshaped unifacial andesite metate from surface of rockshelter (not collected).

Fig. 6



a

b

c

The presence of so many of the milling tools on the surface suggests their use during the latest period of occupation. Johnson (1984:198) has noted that the mano and metate occur throughout the 4000 year known occupational sequence "with an apparent greater emphasis or a different emphasis in later times." Hopper mortars also are noted as occurring over a long period of time but with possible greater importance at an earlier date. It is interesting to note that in the comparison of presumed seasonal camps and presumed winter villages, hopper mortars are far less frequent (13.6% as compared to 45.9%) (Johnson 1984:204). Following Johnson (1984:203-204), in assuming a fall acorn, berry and mortar association (with possibly spring bulb processing) and a spring grass and compositae seed-metate association, it would appear that milling tools indicate usage of this rockshelter in at least the spring and fall when these nearby crops were harvested.

It is perhaps somewhat unusual that one mano had red ochre (hematite?) staining. Johnson (1984:198) has noted that "Food processing implements were used for a restricted range of activities which did not include the processing of large amounts of pigment or other materials." This unusual aspect may be the grinding of ochre (ceremonially or ritually related?) at a small secondary camp. Possibly the inhumation of one or more individuals had a connection. On the other hand, it may be the result of perfunctory preparation of pigment for "simple" tool or body decoration.

FLAKED STONE TOOLS

Projectile Points

The small collection of eleven typable projectile points is notable by its diversity. Six separate types are definable following the morphological typologies of Greenway (1982) and Johnson and Theodoratus (1984). Various characteristics of these points are provided in Table 3. Selected illustrations are presented in Fig. 7.

The most frequent type, with four, is the Southern Cascade Serrated Series, all found in the top levels (214-2, 214-3, 214-31, 214-46). This is one of the latest forms dated from A.D. 1500 to A.D. 1850, and they are associated with the Mill Creek Complex (Greenway 1982:58) (Figs. 7g, h, j, l). It is noteworthy that Greenway (1982:166) has stated that some in the collection he analyzed from Dead Man's Cave were made of bottle glass. Furthermore, blade edges were noted to frequently exhibit rounding/polish and crushing, an indication that "these hafted artifacts were probably multifunctional." The specimens under study here in two cases exhibit reworking but wear patterns are not evident. Obsidian hydration results, discussed further later, include two with no-observable bands and one 1.0 micron reading, substantiating the late date proposed for these points.

Another late point type recovered from Spider Rockshelter is the Dye Creek Corner Notched type (Greenway 1982:143) with one example (214-45) from a surface level (Fig. 7i). The obsidian hydration band reading is 1.4 microns, within the late range.

Two points fall within the Gunther Barbed type (214-1, 214-28) (Treganza 1958:14-15, 22; Greenway 1982:143) (Figs. 7e and 7f). These are placed by Greenway (1982:57) in the A.D. 600 to A.D. 1300 timeframe falling within the Dye Creek Complex. This is in general accord with Sundahl's (1982:188) placement in the Redding area in the range A.D. 700 to A.D. 1850 except that they continue into latest prehistoric-early historic times to the north, possibly because they were not displaced or replaced as here in Yana territory.

Two small leaf-shaped points (bifaces or blanks?) were recovered, both in Unit 2 in the first and second levels (214-32, 214-75) (Fig. 7b and 7m). These artifacts resemble the Type 4 small leaf-shaped specimens of Greenway (1982:Figure 27, 57, 139) who placed these within the Kingsley and Dye Creek Transition dated from A.D. 1-800 (Table 4). The two Spider Rockshelter specimens are chert and quartzite respectively, relatively rare materials utilized in the region. One specimen is longitudinally split, perhaps from the impact from an arrow point hitting a hard substance. The quartzite specimen is thick near the base and may actually have been hafted on the pointed end or hand-held and used in light cutting/scraping activities. While the edges are somewhat blunted the quartzite is coarse and slightly weathered and use signs are not clear.

TABLE 3
Projectile Points and Perforator Characteristics - CA-Teh-1432

Cat.#	Type	Ln.(cm)	Wd.	Th.	Wt. (gms)	Material	Location
214-1	Gunther Barbed	2.4 (est.)	1.75	0.35	0.9 (est.)	Obsidian	Unit 1, 0-10 cm
214-28	Gunther Barbed	2.1 (est.)	2.0	0.45	1.2 (est.)	Obsidian	Unit 2, 0-10 cm
214-2	Southern Cascade Serrated	1.8 (est.)	1.3	0.23	0.35 (est.)	Obsidian	Unit 1, 0-10 cm
214-31	Southern Cascade Serrated	1.7	1.1	0.27	0.4	Obsidian	Unit 2, 0-10 cm
214-3	Southern Cascade Serrated	1.0	0.85	0.3	0.3	Obsidian	Unit 1, 0-10 cm
214-46	Southern Cascade Serrated ?	1.25 (est.)	0.64	0.23	0.3 (est.)	Obsidian	Unit 2, 0-10 cm
214-45	Dye Creek Corner Notched	1.5 (est.)	1.0	0.3	0.4 (est.)	Obsidian	Unit 2, 0-10 cm
214-68	Deadman Side Notched	3.4 (est.)	1.6	0.65	3.5 (est.)	Basalt	Unit 2, 20-30 cm
214-76	Kingsley Short-Stemmed	2.6 (est.)	2.1	0.6	2.4 (est.)	Obsidian	Unit 3, 0-10 cm
214-32	Leaf-Shaped	2.7	1.6	0.6	2.4	Quartzite	Unit 2, 0-10 cm
214-50	Leaf-Shaped?	2.4	?	3.3	?	Chert	Unit 2, 10-20 cm
214-6	Tip	?	?	?	?	Obsidian	Unit 1, 0-10 cm
214-7	Tip	?	?	?	?	Obsidian	Unit 1, 0-10 cm
214-5	Perforator	1.5 (est.)	0.8	0.22	0.2 (est.)	Obsidian	Unit 1, 0-10 cm

FIGURE 7

Projectile Points And Leaf-Shaped Tools

a.	214-68	Deadman Side Notched Projectile Point (Basalt)
b.	214-32	Small Leaf-Shaped Projectile Point (Quartzite)
c.	214-75	Small Leaf-Shaped Flaked Stone Tool (Chalcedony)
d.	214-76	Kingsley Short-Stemmed Projectile Point (Obsidian)
e.	214-1	Gunther Barbed Projectile Point (Obsidian)
f.	214-28	Gunther Barbed Projectile Point (Obsidian)
g.	214-2	Southern Cascade Serrated Projectile Point (Obsidian)
h.	214-31	Southern Cascade Serrated Projectile Point (Obsidian)
i.	214-45	Dye Creek Corner Notched Projectile Point (Obsidian)
j.	214-3	Southern Cascade Serrated Projectile Point (Obsidian)
k.	214-5	Perforator (Obsidian)
l.	214-46	Southern Cascade Serrated Projectile Point (Obsidian)
m.	214-50	Small Leaf-Shaped Projectile Point (?) (Chert)

Fig. 7

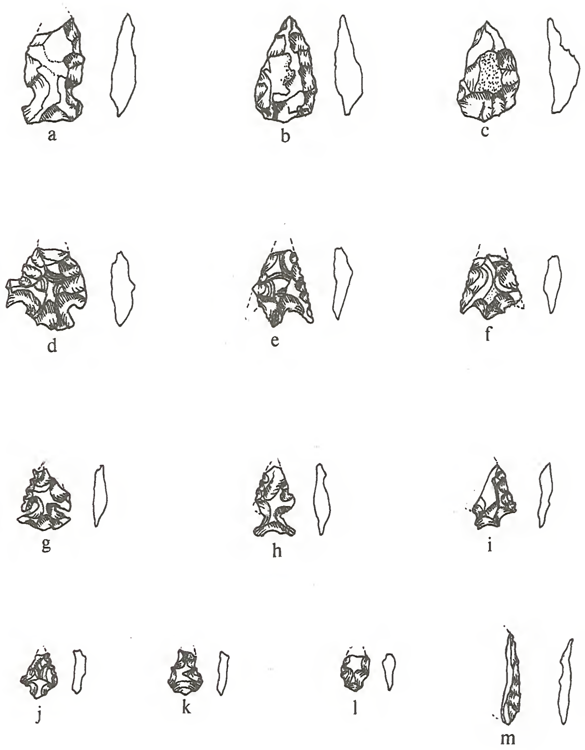
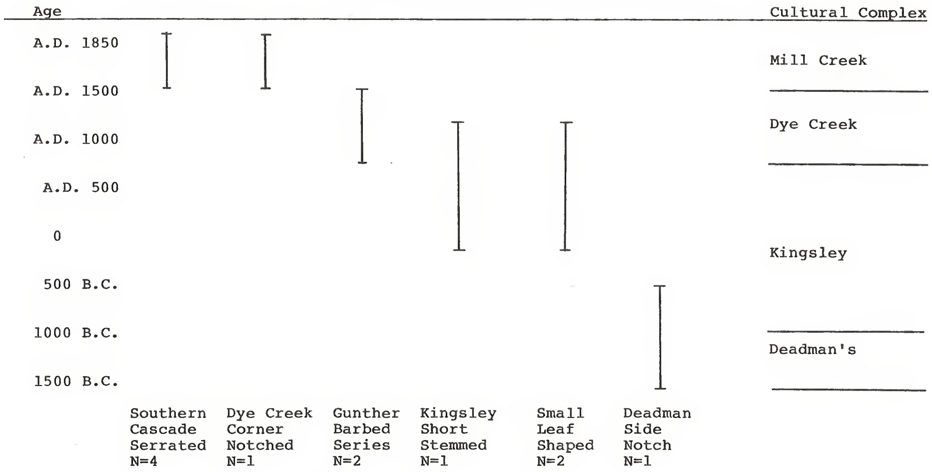


TABLE 4

Spider Rockshelter Projectile Point
Temporal Placement and Frequency



POINT TYPE (After Greenway 1982 and
Johnson and Theodoratus 1984)

A single example of a Kingsley Short Stemmed point (214-76), as defined by Greenway (1982:Fig. 19; 152), was recovered in the top level of Unit 3 (Fig. 7d). He places this point in the Kingsley/Dye Creek Transition correspondingly dated from A.D. 100 - 800. An obsidian hydration reading from this point is the largest obtained at 7.8 microns. This may suggest an earlier date for this form, or at least for this point, which may be a re-worked earlier specimen. Other possibilities include increased hydration from burning or curation. Greg Greenway (personal communication 1986) indicates specimens at Dead Man's Cave frequently had overall hydration rates that were higher than corresponding types from similar sources in the Lassen National Forest.

A single basalt example of a Deadman Side-Notched point was found in Unit 2, 20-30 cm, the deepest point from the site. This form is defined by Greenway (1982:160; Fig. 23).He notes its close resemblance to the Southern Cascade Side-Notched (1982:160; Fig. 22). The Deadman type is dated at 1000 B.C. - 500 B.C. within the complex of the same name (Greenway 1982:57) (Fig. 7a), while the Southern Cascade Side-Notched dates within the Kingsley Period (A.D. 1-800).

Finally, two obsidian biface or point tips were recovered in Unit 1, 0-10 cm level. Whether breakage occurred during manufacture or for some other reason is uncertain.

The projectile points recovered from the site seemingly indicate long-term use of the shelter, perhaps in the order of nearly 3000 years. However, the majority of the points are from late prehistoric times. It is worthwhile noting Flenniken's (1984:199) statement that: "End products alone, i.e. projectile points, are not sound individual indicators of a prehistoric culture or prehistoric culture change because of the various morphological changes they undergo while in systemic context as a result of skill or lack of skill, breakage and rejuvenation, hafting, and use." It has been pointed out that several of the points have been re-worked. Also, some may have served several functions as indicated by Greenway (1982:87) for similar examples at Dead Man's Cave. Despite Flenniken's caution, it is noteworthy that locally Greenway (1982:91) did find some validity in his point typology as a measurement of cultural-temporal variability. Furthermore, the obsidian data at Spider Rockshelter suggest a temporal division between larger (dart?) and smaller (arrow?) points. Still, curation or collection of earlier points by later people cannot be ruled out.

Perforator

A small obsidian (Tuscan source) perforator was recovered from the top level of Unit 1 (Fig. 7k). The bit end has been broken so exact length can only be estimated (Table 3). The cross-section of the bit is lenticular. The sharp edges and narrowness of the bit imply a perforating function rather than a drilling use. No obvious wear is evident on the tool remnant.

Small Leaf-Shaped Flaked Stone Tool

A single example of a small probable leaf-shaped cutting-scraping-engraving tool was removed from the 0-10 cm level of Unit 3 (Fig. 7c). Originally, it was believed this was a small preform or leaf-shaped point but closer examination under a hand-lens suggests apparent utilized edges on both ends. In addition, irregularities in the chalcedony material would have prevented further thinning.

The distal end exhibits a small beak and nibbling along one edge. The slightly concave, thinned proximal end exhibits one area of bifacial flaking and nibbling. The edges are less than 30 degrees suggesting tool use as a graver and for light cutting-scraping activities. The specimen is 2.45 cm long, 1.58 cm wide, and 0.62 cm thick.

Large Flake Tool

A large basalt flake uniformly worked with an edge angle of 30 degrees was recovered from Unit 2 (Table 5). The utilized edge exhibits considerable smoothing on the retouched side as if used in hide or wood working (cf. Newcomer and Keeley 1979) (Fig. 8a).

Utilized/Retouched Flakes or Fragments

Seven artifacts fall within this category of utilized or retouched flakes or fragments. Two of the larger specimens appear to be broken bifaces, one of chert and one of petrified wood, with lateral edges subsequently worked and used as small unifacial scraping-like tools. Four of the specimens are small obsidian flakes or flake fragments generally exhibiting nibbling on selected edges, apparently from light cutting activities. One of these tools (214-29) has an obsidian hydration reading of 1.0 microns. Specific characteristics for these tools are listed in Table 5.

CORES AND DEBITAGE

Six basalt "cores" were found, two on the surface and four during excavation. One of these items (Fig. 8c) may be classified as a rejected unfinished biface. Also, the designation "core" is advisedly used as several of these items may have served in chopping (cf. Figs. 8 and 9) or planing functions. However, virtually no blunting or crushing from use (or platform preparation) is evident on the edges. It must also be considered that these artifacts served as both a source of flakes for small tools as well as tools.

The sinuous edge present on most of these items is the result of alternating blows struck along the edge. Most flake scars are from step flakes, generally short and thick and presumably unusable. No apparent utilized flakes of basalt are evident in the sample, and only one basalt projectile point is present. Certainly, artifacts made from these flakes could have been removed from the site. These factors together suggest tool use for some of these specimens (see especially Fig. 9a).

TABLE 5

Retouched Stone Flakes (or Fragments), Cores and Larger Flake and Core Tools

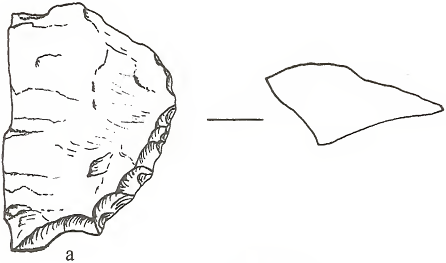
Cat.#	Type	Ln(cm)	Wd.	Th.	Material	Location	Remarks
214-34	Ret. Flake (Steep)	2.3	1.65	0.64	Chert	Unit 2, 0-10	Uni-Convex
214-33	Ret. Flake (Steep)	2.97	2.0	0.7	Petrified Wood	Unit 2, 0-10	Uni-Convex
214-27	Ret. Flake	2.63	2.05	0.78	Obsidian	Unit 2, 0-10	Bif.-Straight
214-53	Ret. Flake	2.03	0.82	0.32	Obsidian	Unit 2, 10-20	Uni-Straight
214-49	Ret. Flake	1.5	1.0	0.35	Obsidian	Unit 2, 10-20	Uni-Convex
214-4	Ret. Flake	1.35	1.32	0.45	Obsidian	Unit 1, 0-10	Uni-Convex
214-29	Ret. Flake	1.47	1.22	0.45	Obsidian	Unit 2, 0-10	Uni-Concave
214-48	Large Flake Tool	6.53	4.58	2.2	Basalt	Unit 2, 10-20	Uni-Convex
214-84	Core (Tool?)	6.4	5.65	4.1	Basalt	Surface	Bif.-Sinuous
214-85	Core (Tool?)	8.94	7.08	2.59	Basalt	Surface	Bif.-Straight
214-66	Core	5.65	4.9	3.9	Basalt	Unit 2, 20-30	Possible Tool
214-67	Core	6.05	5.85	2.77	Basalt	Unit 2, 20-30	No Wear Evident
214-40	Core (?)	6.83	6.65	2.84	Basalt	Unit 2, 0-10	Rejected unfinished biface
214-35	Core	4.85	4.42	2.05	Basalt	Unit 2, 0-10	Exhausted

FIGURE 8

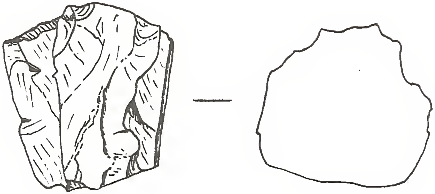
Cores and Large Flake Tools

a.	214-48	Large Flake Tool (Basalt)
b.	214-66	Core (Basalt)
c.	214-40	Core or rejected unfinished biface (Basalt)

Fig. 8



a



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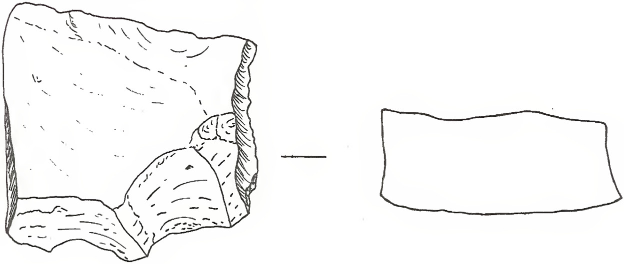


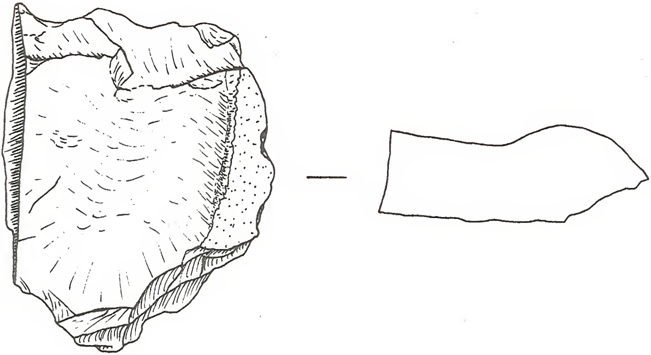
c

FIGURE 9

Cores or Core Tools

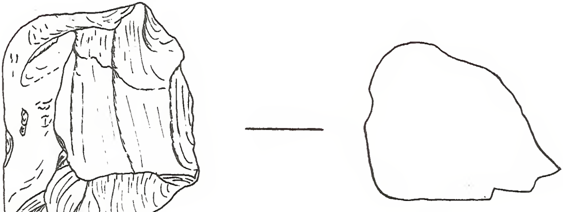
a.	214-85	Core or Heavy Duty Tool (Basalt)
b.	214-84	Core or Heavy Duty Tool (Basalt)

Fig. 9



a

0 1 2 3CM



b

These artifacts are, generally, nondiagnostic. Surface and near-surface finds suggest at least some are late prehistoric in age. Pertinent characteristics are presented in Table 5.

A detailed analysis of debitage is presented in Appendix 2. Debitage includes chipping debris resulting from core reduction or further reduction of flakes or chunks. Obsidian, basalt, and fine-grained igneous materials compose the bulk of the material.

Obsidian flakes and shatter exhibit no bipolar reduction but are the result of reducing obsidian pebbles, in rare cases possibly acquired from Mill Creek, and thinning, maintenance, rejuvenation and re-sharpening of tools. Flakes are mostly of the small thinning type representing secondary activities.

Basalt and other fine-grained igneous flakes are the byproducts, for the most part, of primary reduction, thinning, and shaping of blanks and tools, principally of the larger varieties.

FIRE AFFECTED ROCK

Fire-affected rock was present within the cultural deposit. However, no quantified study was conducted. Based on excavators' observations, the number of fire-affected (cracked, smudged, stained and/or angularly broken) rocks, generally cobble size (ca. 5-8 cm diameter), was small. An added consideration is the presence of broken angular cobbles in the ceiling agglomerate. For each 10 cm level, perhaps 10-15, or less, occurred. Their presence in a living area deposit can be expected, reflecting cooking-baking activities.

ASH LENS FEATURES

In Unit 2 at a depth of about 5 cm, an ill-defined ash lens was encountered. The soil characteristics of this ash lens are presented in Table 1. A small, ashy area was recorded within the top level of Unit 1 as well. Each of these lenses measured in the neighborhood of 30 cm in diameter and 5 cm thick. The ashy deposit contained small flecks of charcoal but no large pieces nor burnt bone. Some oxidation of surrounding sediments was noticeable. Flotation of part of one hearth revealed no burnt seeds. Each appears to have been a general fire area probably associated with cooking-heating functions, and far less likely ash disposal areas.

INHUMATION

A single burial was encountered during the excavation of Unit 3. These remains were only partially exposed in an attempt to determine position, sex and mortuary accompaniments without removal. The burial was first reached at a depth of only 10 cm. It appears that a fair amount of disburbance has ensued since placement, primarily, it would seem, from rodents and deterioration.

The bones are not articulated but their general placement beneath a loose cairn of andesite cobbles and boulders suggests a tightly flexed primary inhumation on its left side possibly oriented to the west (Fig. 10). A cursory assessment of the bones further suggests a young adult was buried here at the mouth of the shelter in its deeper portions. No artifactual accompaniments were determined.

Wiant (1981:57) notes that: "Some of the earlier inhumations from the Kingsley Complex have rock cairns." However, this is probably not an exclusive pattern to this period since the basic methods used to dispose of the dead apparently changed little over the last 2500 years (Wiant 1981:56).

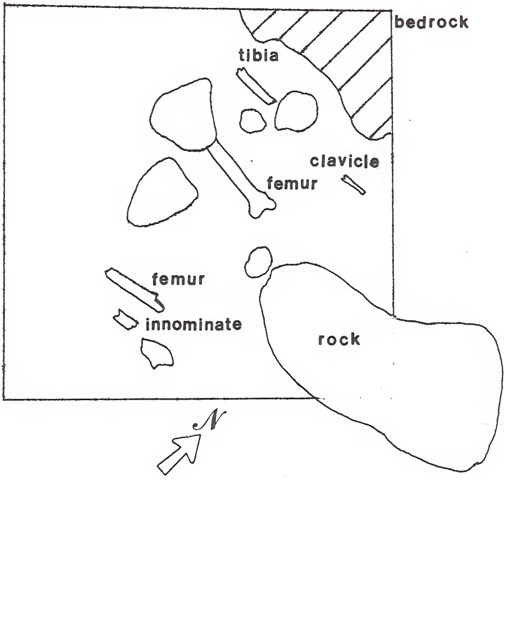
FAUNAL REMAINS

The data recovery program resulted in the collection of 18 identifiable bones. Detailed results of the faunal analysis are presented in Appendix 3 by Dwight D. Simons. Of the identifiable bone, mule deer, unidentified Artiodactyla, pocket gopher and California ground squirrel are represented. These are all found in the site vicinity today and were present during prehistoric times as well. The ground squirrel and pocket gopher could be intrusive.

BURIAL

Unit 3

10—20 cm



Simons found no sign of cultural modification on the bones recovered. However, some fragments exhibit signs of burning, either from cooking or inadvertent exposure to human fires within the shelter.

BURNT ACORN MEAT

In Unit 3, 0-10 cm, the burnt meat of a single acorn was recovered. As acorn usage was historically very important among the Yana and since a hopper mortar feature is present, such a recovery was not unexpected.

OBSIDIAN STUDIES

Both obsidian hydration and x-ray fluorescence analyses of a select sample of obsidian artifacts and flakes were conducted. The results are presented in appendices 4 and 5. All but one known late obsidian point were selected for obsidian hydration along with a retouched or utilized flake and four unused flakes. The flakes and flake tool and four of the points were in turn subjected to x-ray fluorescence. The author's familiarity with Tuscan obsidian and monetary considerations led to the elimination of several of the points. Those formally analyzed included the two presumed older points discovered to be made from the Kelly Mountain geochemical type and the two later types and late flakes and flake tool made from obsidian of the Tuscan geochemical type. Both sources are found in the general vicinity (Cascade foothills for Tuscan and the area just south of Mount Lassen National Park for Kelly Mountain). Overall, Tuscan obsidian is superior to Kelly Mountain obsidian. It may be coincidental that the earlier point types are of the Kelly Mountain source. The sample is too small to conclude that late period shelter occupants were no longer using this source, obtainable either through trade or, more likely, in a seasonal round to the higher reaches of the drainage where the source occurs. However, Greenway and Nilsson (1986:8) have noted that at nearby Dead Man's Cave (Teh-290) and at Teh-966 within ethnographic Yahi Yana territory there was a decline in the use of Kelly Mountain obsidian after about A.D. 800, perhaps attributable to a Maiduan entry and settlement in the source area.

The hydration results suggest a long-term use of the rockshelter. However, the paucity of cultural remains (relatively speaking) indicates occupation was sporadic. The possibility that the larger, older points are heirlooms or finds by more recent occupants cannot be dismissed. Debitage with large hydration readings could be obtained; this might add support to the long-term occupation hypothesis. Such readings could also indicate the reworking of older points. Furthermore, if some of the debitage--implying manufacture in the shelter--can be determined to be of the Kelly Mountain geochemical source and have small and large hydration readings, this could imply not only long-term occupation but procurement of raw materials from the source as well. However, visual sourcing by Elena Nilsson and Greg Greenway suggests the debitage is all Tuscan (personal communication 1986).

Overall, finished dart points (Kelly Mountain source) seemingly indicate a finished tool kit for hunting by mobile foragers. Convenience tools would consist of local volcanics. Later site occupants made use of Tuscan obsidian and/or artifacts obtained from the north.

DISCUSSION

The research design presents a number of hypotheses aimed at answering questions regarding the chronological positioning of Spider Rockshelter, the lifeways of the various inhabitants, and the place of this site within a larger settlement and economic setting, including lower Mill Creek Canyon and beyond. The research design was constructed as well for use in future work in the region.

In conducting the excavation, aimed ultimately at determining the site's significance (research potential), expectations were not high. Still, it was hoped that sufficient data were present to contribute toward a further understanding of the regional archaeology and human eco-systems. In this regard, the project was somewhat successful. As will be shortly apparent, the data allow the refinement of some of the hypotheses generated and further development of a model of regional cultural history and lifeways. Nevertheless, the overall research potential of the site was determined to be limited, especially when considering what further information could be obtained by additional excavation. Also, larger, deeper, more complex sites nearby offer better research opportunities.

The first general research topic (see Appendix 1) deals with questions concerning culture chronology. Large obsidian hydration bands and possible early style projectile points may indicate the rockshelter was first occupied as early as 3000 years ago (Deadman Complex). Small, late point types and minimal hydration band readings indicate more clearly that the pronounced use was probably during the latest prehistoric period (Mill Creek Complex). Some use during intermediate periods (Kingsley/Dye Creek) also appears evident, and this may be the time of initial occupation. It must be understood that earlier projectile points may have been collected by later occupants.

There is no evidence to indicate site occupation during the contact period (cf. Baumhoff 1957). It is possible that initial activities at this small rockshelter came on the heels of local growth within Hokan-speaking hill users. Alternatively, adjacent or intruding (from the Valley or Almanor locations) group expansionism may have resulted in a more concentrated hill population seasonally needing more places for sheltered use, or at least more dispersed use to better (more locally) exploit the resource diversity. But there are no data available to counter the hypothesis that some occupants of the larger nearby rockshelters and open sites simply wished to periodically use nearby, smaller locations which were more sanitary and offered seclusion or less conflict. And a combination of factors may have come into play. Deer, Mill, Dye, and Antelope creeks' canyon country contains numerous small utilized rockshelters

in addition to larger occupation rockshelters. What is perhaps significant is the possible "early" use of one small shelter suggesting a continuity for up to several thousand years of a broader range of seasonal site occupation (cf. Wiant 1981:59).

The conclusion of site use perhaps corresponded to population depletion and consolidation at the time of contact but prior to (significant?) acquisition of Euro-American artifacts. Such items, as noted in Appendix 6, were recovered at larger nearby sites (also see Wiant 1981:144). (One must be cautious in associating surface historic artifacts with Indian sites due to the ranching-homesteading activities of the Euro-Americans). In addition, the Merrill Homestead or line shack (dated from the late 1800's) is located several hundred meters above the shelter on a flat near the south canyon rim. The placement of a burial in a shallow grave within the shelter, and, hence, perhaps late in time, could have led to site avoidance at the time of contact as well.

No conclusions can be reached regarding site stratigraphy and site age. The deposit is relatively shallow and exhibits no clear-cut cultural strata.

The second major topic, already touched upon above, concerns settlement-subsistence of the site and its place in the local system or systems over time.

It is hard to assess the fit of this site and its environs within the settlement-subsistence model of the Southern Yana/Yahi and their prehistoric predecessors. Certainly, the few faunal and plant remains, the milling tools, and the hunting-butchering-processing (points and flaked stone tools) assemblage suggests a reasonably diverse exploitation. The data provide no help in assessing whether there were any food surpluses and resulting leisure time and flexibility. Previous archaeological work in this region, discussed elsewhere, provides few hints of much free time among prehistoric groups. It should be noted that, within the sample excavated, no food caches or storage containers were present or have survived.

It would appear that acorns, possibly other soft plant foods, and hard seeds were processed within the shelter. Deer, probably other large game, and various small animals were locally hunted and later consumed in the shelter. These and a variety of other plant and animal resources were within easy range of the occupants. Hearth remains, a burnt acorn, burnt and unburnt animal bone, and fire-affected cobbles suggest small fire or rock oven cooking and heating. Butchering marks are not readily present on the faunal remains. Food remains appear to have been disposed of in the shelter, or very close to the probable living area.

Seasonally, the data support Wiant's (1981:127-128) model of foothill fall-winter-spring occupation-use (although winter use is only assumed) based on acorn exploitation in the fall (mortar, burnt acorn meat) hard seed (mano-metate) exploitation in the spring, and deer hunting during all three seasons (cf. Wiant 1981:127). There is no information supporting fisheries exploitation.

Numerous sites have been recorded in Mill Creek Canyon, and these have been discussed in some detail in Wiant's (1981) thesis. While this site was not discovered prior to his work, its discovery and study adds to the refinement of Wiant's ecological model of Southern Yana/Yahi (and their predecessors) subsistence and settlement.

Wiant (1981:139) notes that four types of Southern Yana sites should be expected in the foothill zone: winter villages, temporary fishing camps, temporary deer hunting camps, and task sites. Assuming Teh-1432 would fall within a time frame congruous with the Southern Yana/Yahi pattern, the Spider Rockshelter does not seem to easily fit these categories and their defined assemblages and refuse.

Wiant (1981:154) hypothesizes that temporary deer hunting camps

> "should contain artifacts and features associated with daily maintenance (e.g., manos and metates, hopper mortars, pestles, chipped stone, bone tools, and hearths). Artifacts more specifically related to hunting, such as projectile points, chipped stone tools associated with the butchering and processing of large animals, and bone tools used to clean and prepare hides (e.g., deer pelvis hide scraper and deer foreleg or rib dehairer), should occur in larger quantities than at winter villages. In addition, large quantities of deer bone and antler should be present." Permanent structures should be absent and items necessary for daily maintenance should not be present in quantities (Wiant 1981:141).

Wiant (1981:155) found few sites in the records which fit the criteria. One site, however, M-23, is located only about 750 m from Spider Rockshelter on the main south canyon rim escarpment. This is adjacent to the upper end of Tenmile Hollow, a major pass between Big Dry Creek and Mill Creek. Wiant (1981:155) notes:

> "This site's locational and physical characteristics are not typical of villages. It has a small surface area, receives no direct sunlight during the winter, and has a water supply which is too small to provide the amounts necessary to process and cook acorns. It is, however, situated in a location conducive to deer hunting, since deer herds travel between Mill Creek and Dry Creek through Tenmile Hollow."

This shelter also contains a large quantity of flaked stone and milling-related artifacts along with "a significant amount of deer bone" (Wiant 1981:155). It is also noted that this is a region of very low oak density (i.e. low acorn exploitation).

Based on this author's visit to the shelter, it can be argued that M-23 contains a significant deposit related to long-term and/or intense use. Glass trade beads on the surface indicate contact period use. The "small" surface area attribute is probably only the result of the confines of the shelter which, by canyon standards, is large. It may well be that two sub-types of winter villages are

present, along the creek and large rockshelters within the canyon where they occur and have sufficient flat floor space and little roof fall. Water is within easy distance from virtually anywhere in the canyon, either from seeps, springs or secondary streams, or from Mill Creek proper. The question is whether, in fact, there are differences in use between the large open sites and the large occupied rockshelters, despite immediate environmental differences. All ethnographically reported food products of importance in the foothills are readily accessible within one or two hour's walk, easily within the known daily exploitive range of hunters and gatherers/foragers.

So where does this put Spider Rockshelter? It is intriguing to note its position near a major deer route and purported temporary deer hunting site. The assemblage does, for the most part, fit Wiant's hypothesized deer hunting camp assemblage. But the remains could easily fit a general exploitive pattern location as well. And the proximity of the sites suggests a possible relationship. Wiant (1981:149) notes that the smaller sites, apparently including all rockshelters, "may represent various types of task sites occupied contemporaneously with the potential villages, or they may reflect a different adaptive strategy not considered by the proposed model. Another possibility is that they were each occupied by a nuclear or extended family, and that a group of such sites formed a village." Furthermore, "It is also probable that some of the smallest sites, specifically small rockshelters that lack deposits and have few associated artifacts represent task sites." Certainly the Spider Rockshelter is above this level but below the level of major open (e.g. village) or rockshelter occupation site.

It seems unlikely the Spider Rockshelter functioned primarily as a hunting camp, although the recovered remains and the location suggest this was an important function, especially in terms of deer hunting. More likely it represents a secondary occupation location for multiple hunting and gathering activities and limited processing and consumption functions and necessary ancillary tasks (i.e. tool maintenance-manufacture). The amount of trash suggests this rockshelter was used very intermittently for a long period by a few people, perhaps only a family or two at any one time. There is no indication one way or another regarding dietary change. The tool kit is consistent with the procurement and processing of the few recovered flora and fauna remains--as near as can be determined--possibly related to the larger nearby rockshelter (M-23) and creek-side villages.

The next topic deals with technology, an issue in part discussed above.

The recovered technology at best can be described as rudimentary and utilitarian. Core and debitage remains indicate that the occupants were reducing small (Tuscan) obsidian nodules, perhaps obtained from the gravels of Mill Creek or from areas not too distant (ca. 25-50 km). These activities were not production oriented with regard to obsidian, merely expedient, tied in with rejuvenation and resharpening of points and small cutting-scraping tools. Basalt and

other volcanic materials recovered as flaked stone, on the other hand, suggest thinning and shaping of larger cutting-scraping-chopping tools. Milling tools are local cobbles and slabs of rock exhibiting little or no pre-use modification.

The projectile points recovered are basic, common items to the region, although they may have been imported from other locations. Overall, the technology expressed at this site fits within the regional pattern and the ethnographic record. There is no indication of high labor costs in any product manufactured, although the absence of perishables clouds this conclusion. The hopper mortar and awl tip suggest basketry use, common among many northern California historic Indian groups. To briefly reiterate, the technology expressed in the recovered remains suggests day-to-day living oriented toward the hunting, gathering, processing, and consumption of various food products, and little else.

The trade-exchange topic has been briefly broached in some of the above discussion. It is clear that Kelly Mountain obsidian points were obtained or brought to the site from the upper area of the drainage basin. Some of the Tuscan obsidian points may have come from outside sources, but within the same tribal network. The absence of Kelly Mountain obsidian in a late context may relate to a cut-off in its availability due to a Maiduan intrusion about A.D. 800. Little can be said regarding trade-exchange beyond this as the occupants of this rockshelter were apparently not within the mainstream of exchange or trade--or at least they left behind no such evidence that has been preserved. Furthermore, the rockshelter was probably utilized before Euro-American contact. At least the obtainment of Euro-American goods is not evident as opposed to nearby larger sites such as M-23 on the canyon rim above (trade beads) or CA-030-217 on the creek below (grinding wheel millstone, enameled ware pan, iron rod). This, of course, could merely be a factor in site function as opposed to possession by the occupants who may have left exotic materials at the larger camp. The Merrill Homestead above (circa 1870's-1880's) probably was established after site abandonment (or could have been a cause in its abandonment).

A brief statement regarding the deposit formation processes of this site has been presented in the research design section. Certainly the various natural and cultural processes that have occurred during and after site use have influenced not only the preservation but also the placement of cultural remains within this deposit.

It would appear that bioturbation has been less severe at this site than nearby open villages, in part due to the relatively shallow nature of the deposit. Still, rodent burrowing is apparent and rootlets and small insects have contributed to the deposit's disturbance. Thus, stratigraphic differences in deposit yield can only be viewed as general trends. What is more, human fires and the burial have contributed to deposit mixing. It would also appear that the occupants dumped materials from the shelter proper onto the talus in front, as in refuse disposal-cleanup activities.

Undoubtedly, cultural materials were also deposited directly onto the shelter apron by activities there in addition to shelter clean-up.

There appears to be little evidence of downslope movement of cultural materials through natural means, partly due to the limited nature of the deposit itself with a protected upper slope (shelter front). The deposit represents a combination of natural and culturally-produced materials. Slopewash has resulted in a deposit of fine sediments within one end of the shelter. Roof fall of cobbles and smaller particles of rock and bedrock floor decomposition have contributed to the fill. Cultural trash and sediments introduced through human hosts have further added to the deposit. Finally, decomposed vegetation and animal residues have contributed to deposit formation. Intuitively, it appears that older materials will generally be near the bottom of the deeper area of the deposit, younger materials nearer the top but with some expected mixing. Horizontally, natural movements of cultural remains would seem slight, whereas cultural translocations have probably been significant, masking activity areas. The human contribution to the deposit, as a whole, is at best moderate (no more than ca. 50%) probably representing short-term, low intensity activities over a relatively long period of time.

CONCLUSIONS

The incremental increase in knowledge and the development and refinement of archaeological models can be facilitated by studying the small, seemingly marginal sites as well as those more complex sites, especially if such work is done with theoretical and methodological foci. Combining information within a regional perspective and undertaking such work within a well-defined, workable research format is essential. The Spider Rockshelter gives every impression that the regional archaeological complexity is, perhaps, greater than previously surmised; that there is much yet to be learned from both large and small sites, whether single or multi-component.

Small rockshelters like Teh-1432 have generally been considered task specific locations of larger nearby sites. This simply is not always the case. Dreyer (1984:93), in his foothill study just south in Butte County, states that:

> In the upper foothill zone, exploitation appears to have been carried out from small base camps in rockshelters. Many of these rockshelters are small and only capable of supporting, at most, single family units or small groups of hunters and/or gatherers. Given the dispersed nature of the foothill game and plant resources, the use of small dispersed procurement groups may have been the most efficient method of resource procurement in the zone.

While Dreyer is discussing a different archaeological and ethnographic area, his findings have merit in terms of the Mill

Creek area. However, the Mill Creek pattern at least is probably more complex. General exploitation of the various canyon resources was probably facilitated by groups in large open villages, smaller open campsites, and large and small rockshelters. The environment was simply not so homogenized and, for the most part, variable resources not so distant as to encourage exploitive specialization other than by age group and sex.

In examining more closely some of the specific conclusions that can be drawn from the study and which led the author to the judgment presented above, the following statements are offered.

The Spider Rockshelter (CA-Teh-1432) was possibly utilized up to two to three thousand years ago by at least hunters, if not a more diversified hunting and gathering family or two. Intermittent use apparently has been the case until near the time of contact. More use by presumed family hunter-gathers is evident during late prehistoric times, either through more frequent use (on a seasonal basis) and/or use by more individuals subject to space limitations. Use is assumed to have been fall-winter-spring with at least deer, rodents, acorns and hard seeds exploited.

Initially, or later in time, more intensified use may be the result of population expansion or consolidation due to external pressures by competing populations. This conclusion is equivocal, however, as use of the shelter may have been expedient owing to such needs as sanitation improvement over nearby locations, a desire or demand for sub-group isolation, or other factors.

Cessation of shelter use presumably coincided with the period of contact and further group retrenchment, population decrease, and eventual cultural extinction. Historic goods are absent and it seems unlikely that the shelter would have been used with the establishment of the nearby homestead or line cabin and the cultural conflicts that that would have created. One can also offer the speculation that the inhumation created (a period of) site avoidance.

The artifact assemblage is relatively rudimentary, overwhelmingly utilitarian in character. It is one that can best be associated with atlatl and later bow and arrow game hunting, rejuvenation and resharpening of small obsidian tools, and limited production of basalt and other fine-grained igneous flaked stone tools. The predominance of limited thinning and sharpening activities and little actual tool production is a signal of temporary use associated with game and plant/wood product processing. The only bone tool suggests basket manufacture. A basket hopper mortar and manos and metates are indications of acorn and seed grinding, a result of nearby collecting-gathering.

The deposit contains evidence of food processing, cooking and consumption, but at a fairly minimal level.

The presence of ritually related remains is dubious. Ochre staining

on one mano and the human burial are the only suggestions of ceremonially associated activities. Most ceremonial activities probably occurred at larger nearby sites.

External trade or procurement is most evident in the presence of Kelly Mountain obsidian points, especially during earlier use (assuming early point types were not picked up by later occupants). This obsidian comes from upper-drainage areas possibly utilized during the summer, at least before an expanding Maiduan population may have limited access to the Kelly Mountain source. Tuscan obsidian may be available locally, but more likely was derived from northern sources in historic Yana territory. There is no evidence of Valley interaction in any respect.

It seems reasonable--but there is limited direct evidence--that the Spider Rockshelter was tied in socially, politically, economically and even ideologically with other nearby sites in the lower canyon vicinity. This presumption is based on what is known about the settlement-subsistence of the Yahi/Southern Yana in particular and hunter-gatherer groups in general. The nearest prehistoric site is a large rockshelter along the south canyon rim, and there are major open villages along Mill Creek itself just below and within a kilometer or less of Teh-1432 (site records on file with California State University, Sacramento). While site contemporaneity cannot be as yet proven, the canyon in this vicinity within 3 - 4 km contains several score occupation sites of both open and rockshelter form of various sizes. A sizeable population widely exploiting the lower canyon area is indicated. Many of these sites appear to be relatively late in time or contain late components. The population density may have necessitated coeval use of secondary shelters, especially during the late prehistoric, but possibly at earlier times, too.

The Spider Rockshelter provided space to a small family or two at most and perhaps early on a small group of hunters. Activities carried out, by and large, were routine utilizing basic, expedient equipment. Other than perhaps basketry manufacture, there is a lack of artifacts or artifact-manufacturing by-products that suggest labor-intensive activities. For instance, shaping of milling implements is not present.

The evidence from the rockshelter indicates habitation tied in with a broad range of hunting-gathering related activities rather than a specialized site related to a larger nearby village. The evidence is not present to suggest a deer hunting specialization for the rockshelter despite the presence of a historic deer migration route nearby. Certainly, deer hunting was probably an important function of the male occupants, but probably no more so than for those male members of larger nearby sites. Success may have increased with the advent of the bow and arrow.

Overall, Spider Rockshelter would seem to be a sheltered location that harbored one or two family units pursuing a wide range of the usual day-to-day activities carried out by those living in larger, open villages or rockshelters. At least one group must have felt a

sense of place here, interring a deceased family member in the shelter. This small site seems to represent a microcosm of larger occupation locations in the vicinity.

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APPENDIX 1

A Research Design for Archaeological Investigations Within the Mill Creek Canyon Region in the Southern Cascade Foothills With an Emphasis on Limited Testing of Spider Rockshelter (CA-Teh-1432)

Eric W. Ritter

The southern Cascade foothills, centered on Mill Creek, Deer Creek, and other adjoining drainages, have been the scene of locally well-directed and intensive archaeological survey and excavation, mostly through the University of California, Berkeley, University of California, Davis, and California State University, Sacramento. These studies have resulted in a few reports (cf. Baumhoff 1955, 1957), several theses (cf. Wiant 1981 and Greenway 1982) and papers (cf. Johnson 1976, 1983) and various unpublished manuscripts. Still, despite the advances, the gaps in regional coverage and knowledge are enormous. The lack of published information regarding more recent investigations hampers current studies, development of research approaches and evaluation of site significance (i.e. information value).

In 1984, the Bureau of Land Management proposed a land exchange involving several isolated parcels of public land within Mill Creek Canyon. An inventory and evaluation report was prepared for this proposed exchange (Ritter 1984). One of the parcels contains a small rockshelter with some cultural deposits and a surface scattering of flaked and ground stone artifacts and faunal remains. This site has been designated Spider Rockshelter (CA-Teh-1432) due to the presence of a small brown spider scurrying across the shelter floor on the initial site visit (Fig. 1). It was concluded in the inventory and evaluation report that not enough information was present on the surface to adequately evaluate the site's potential for inclusion in the National Register of Historic Places. A preliminary series of research questions was developed in the aforementioned report as part of the evaluation processes. It was recommended that, prior to the land exchange, several test units should be placed in the rockshelter to determine the site's significance based on the cultural remains present and their environmental context. In this manner we can see to what degree the recovered data could contribute to understanding the culture history and processes of the prehistoric inhabitants; toward learning more about the lifeways of the groups who inhabited the region.

In order to adequately sample the rockshelter and properly analyze the recovered data, test excavations must be carefully designed and directed at a series of logical questions or testable hypotheses relevant to the site's and region's scientific research potential, to furthering our understanding of the regional archaeology (knowledge). Questions and hypotheses follow and expand upon those presented in the survey report (Ritter 1984).

The research orientation directed at Spider Rockshelter embodied the principles of cultural materialism, culture ecology, and, to a lesser extent, systems archaeology. The design, as presented, is somewhat abbreviated owing largely to the limited scope of the project and recovery expectations (low), and the limited extent of the site.

The cultural ecology aspects of the design follow Bennett (1976), Orlove (1977), and Butzer (1982). Systems methods are discussed in Sabloff (1981) and Lowe (1982), among others. Orlove (1977:7) notes that:

> "...processual cultural ecology examines the interaction of populations and environments, rather than treating the latter as a passive background to the former. The studies are called processual because they examine shifts and changes in individual and group activities, and because they focus on the mechanisms by which external constraints influence behavior. These points indicate the importance of the incorporation of decision-making into cultural ecology."

Butzer (1982:xi), in a similar direction, indicates that the central concept in the dynamic interactions between human groups or societies and their environment is the human eco-system. He stresses the interdependence of cultural and environmental variables.

Bennett (1976:261), in describing the theoretical underpinnings from behavior science of an adaptive-dynamic approach to cultural ecology, notes: "The level of description is generalized: the social system is seen as a complex of subsystems that are suffused by tension-reducing adjustments of individuals and that lead to exploitation of the physical and social environments for human ends."

It seemed evident that the construction of past culture and behavior at Spider Rockshelter can be viewed from a perspective of social and environmental dynamics. The social system(s) or culture of past peoples or individuals at this site and within the region is assumed to have been composed of a number of interrelated--although not always harmonious--subsystems which were closely tied, for the most part, with the surrounding social and physical environments.

The primary aim of limited investigations is to determine and record: (1) the extent of the deposit; (2) the content and age of the deposit and materials; (3) the significance of the site in terms of its regional setting; and (4) management needs. From an anthropological perspective the primary aim of the recovery-oriented operations was to understand to the greatest extent possible: (1) the adaptive behavior of the Native American group(s) or subgroup(s) (e.g. Mill Creek Complex age) which might be present; (2) the variability in the adaptive mode(s), if present, and (3) the dynamics behind any changes in the human ecosystems. In terms of this second aim, investigations were directed at learning the position of one part or parts of one or more larger adaptive systems

assumed to be principally oriented toward Mill Creek Canyon and the itinerant animal populations, such as deer and salmon, the local plant products, such as acorn, and measuring the site's system(s) within the larger regional system(s).

Anthropológical research should be oriented (to the extent feasible at such a small location) toward understanding various interpretable aspects of sites such as Spider Rockshelter (both sub-systems as well as distinct physical components and other topics). Questions also should be geared toward elucidating or furthering our knowledge, if possible, of regional culture history and processes involved through time in the occupation of the site.

Because of the above, a number of overlapping research topics are designated, topics considered relevant to anthropology, to the public, and which could exemplify a site's significance. These topics are presented hierarchically in terms of those expected to have the greater confidence of understanding through recovery/interpretation and those of lesser confidence. These are also examined in terms of those which are site-specific and those of a regional or comparative nature.

Major topics directed at this shelter include: culture chronology/dating, settlement/subsistence, technology, trade/exchange, and deposit formation processes. Other topics, such as socio-political organization and religious or ceremonial activities, will be considered in a secondary fashion as the data bear.

The culture dynamics of the major topics will be explored to the extent possible in terms of processual questions (changes and decision-making). Attempts at answering questions related to the above topics are predicated on sample size or the nature of the data available, the amount of data recovered, and the treatment of the recovered data. One cannot be so presumptuous as to assume that all questions can be answered with a sample or, for that matter, all of the site's contents while bringing in information from other regional studies.

It is difficult to judge the outcome of small sample test excavations because of the inherent dangers of deriving conclusions from what cannot be anything but a biased sample. Nevertheless, testing within the constraints permitted by funding and labor can allow BLM or another agency or individual to be reasonably responsive to both management needs and scientific concerns.

Jensen and Reed (1979:138-139) have noted that the scientific or research potential of archaeological resources in north-central California derive from three basic considerations: culture history and population movements; understanding socio-economic and socio-political responses to changing modes of subsistence and increasing population densities; and use of the ethnographic baseline. Kowta (1975:11-12) has proposed a series of general working hypotheses related to these topics.

In summary fashion, these hypotheses are as follows:

1. Prior to 3000 B.C. northern California foothill areas were occupied primarily by hunting and gathering Hokan speakers who relied on the exploitation of game and hard seeds with mano and metate processors for the seeds.

2. Prior to or around 3000 B.C. Penutian speakers penetrated the lightly occupied Valley area bringing with them a subsistence mode oriented toward riverine and marshland resources.

3. In time, Valley Penutians utilized their pre-existing subsistence mode to exploit the rich acorn crops which, when combined with salmon fisheries and other food gathering practices, resulted in population expansion into some foothill areas and mountain meadows where salmon/acorn exploitation could continue.

4. Hokan speakers relinquished traditional territories, perished, or were left in marginal areas, such as Mill Creek Canyon, where they were located in historic times (Kowta 1975:11-12).

Jensen and Reed (1979:140-152) provide further discussion on Kowta's model, based on Whistler's (1977) analysis of Wintun prehistory. Whistler has noted that four Penutian groups, each of which originated outside of California within Oregon or the Great Basin, entered and occupied much of California.

Johnson (1983) has presented a general hypothesis based on Kowta and Whistler's work and considerable work among the Yana of his own. Following is an excerpt from his paper which summarizes his opinion (hypotheses) regarding the population-culture history problems.

> "Prior to Penutian speaking populations moving into or through northern California, the Hokan speakers had also begun to use acorns on a limited basis. Sometime during this time period, the first major disruption of the Hokan speaking population by Penutian migrants occurred. This hypothesized movement may have resulted from the eruption of Mount Mazama in the suggested Penutian homeland about 6900 B.C. in Oregon. Through intermarriage and the adoption of some of the Hokan speaking women into the Penutian population, the use of the acorn was acquired, and manos and metates continued to be used for a time. The bountiful supply of fish, clams, bulbs, tules, and acorns in the Sacramento Valley allowed these Penutian speakers to experience a population growth which completely overshadowed the slow growth experienced by the remaining Hokan speakers. As a result, the subsequent expansion of the Penutians into all parts of the Sacramento Valley and some of the adjacent mountain ranges, as postulated by Whistler (1977), began sometime after 1 A.D. and was still in progress at the time of Euro-American penetration into northern and central California.

The ethnographic Wintu had undoubtedly occupied much of their territory by 600 to 700 A.D., and as demonstrated by Johnston (1975) were putting enough pressure on the adjacent southern Yana that they were beginning to withdraw from the western edge of the Southern Cascade foothills by as early as 1500 A.D. It is further suggested that the Shasta Complex, as defined by Sundahl (1982), represents the prehistory of the Wintu over the last 1200 to 1300 years, and the Mill Creek and Dye Creek complexes are representative of the prehistory of the Yana over the same time span (Johnson 1982, 1983). It is also postulated that the earlier Kingsley and Deadman complexes in the Southern Cascades, and the older material from Squaw Creek (CA-Sha-475), Pilot Ridge, Bucks and Borax lakes, are representative of Hokan speaking populations, and not Penutians."

Units of Analysis

I. Culture Chronology

Establishing an accurate chronology of human occupation remains one of the keys to meaningful research. Time sensitive or diagnostic artifacts are useful in dating but must be supplemented to the extent possible by obsidian hydration, radiocarbon dating, and geologic means.

A. Research Questions

Those research questions relevant to Spider Rockshelter include the following:

1. When was the site occupied and abandoned, and what are the causes for initial and terminal use?

2. How do the site contents relate to what is presently known about the "Mill Creek Complex" or earlier complexes?

3. Are there local variations present in the site assemblage?

4. Is there a developmental sequence evident at the site?

5. Is the site content conducive to understanding regional culture change and dynamics?

6. What time markers are present at the site? Can these time markers be refined? Can new ones be established?

7. How does the rockshelter deposit depth (accumulation) relate to cultural/natural (age) processes?

8. Does site content indicate historic contact and, if so, what is the nature of this contact?

B. Hypotheses

1. The site will primarily relate to Mill Creek Complex activities/occupation, and site content will reflect defined assemblages.

2. Midden accumulation will represent limited use of the shelter by individuals or single families for less than 500 years (post A.D. 1000).

3. Initial site use will be the result of a contracting use area and stable or expanding population.

4. Historic artifacts, if present, will relate to re-use of lost or discarded European artifacts associated with passage along the Lassen Trail, or nearby homesteading.

5. Site abandonment will be related to the introduction of European culture and diseases, depredation of the Yana by Europeans and subsequent further shrinkage of utilized areas to refuge site locations, followed by group extinction.

C. Testing Mechanisms

1. Controlled excavation with a dispersed sample of 2 - 3 1m x 1m units representing more than 10% of the deposit. Excavation by arbitrary 10 cm levels unless stratigraphy dictates otherwise.

2. Ethnohistoric documentation.

3. Obtain an adequate sample of obsidian to perform hydration/sourcing by stratigraphic position.

4. Adequately assess technological items using comparative literature for time placement; assess materials for relative stratigraphic position - tie in with soil analysis, C-14 dating, and obsidian studies.

5. C-14 date one sample from a location pertinent to the occupation sequence (e.g. base of midden).

6. Perform adequate soil profiles and analysis to understand midden formation processes and to elucidate stratigraphic events (profile each unit; complete soil analyses on two column samples).

7. Obtain a sufficient sample of known and potential time markers--if possible under funding constraints--to date site occupation and clarify time marker placement, if necessary.

II. Settlement/Subsistence

Wiant (1981) has presented a series of settlement/subsistence models and a research design for the Southern Yana/Yahi which can be partially applied to Spider Rockshelter.

A. Research Questions

1. Do the data (i.e. material culture elaborations) support Wiant's (1981:105) rejected model which views the Southern Yana (Yahi) as a culturally poor group who expended substantial time and energy in the quest for food?

2. Do the data support Wiant's (1981:124) preferred model which takes an opposite view of that stated above, where food surpluses were common, there was resulting free time and flexibility in scheduling activities, and a mixed strategy of resource exploitation?

3. Based on food remains and other resources, was the rockshelter utilized in the fall, as Wiant suggests was the regional occupation pattern?

4. What resource (food product) use is evident, as can be inferred from the remains present in the rockshelter? How were these plants and animals procurred, processed, and consumed?

5. What butchering practices are evident on the bone and what was the disposal pattern for the food remains?

6. Do the rockshelter remains reflect any changes in subsistence use over time? If changes are present, what brought them about?

7. How does Spider Rockshelter relate spatially and temporally with the known site distribution in the region (e.g. 15 km radius) and variability in site configuration?

8. How does the site fit with local micro- and macro-environments (optimal habitation use areas as opposed to moderate and peripheral areas), and what attributes led to the selection of this site (natural and locational features)?

9. Was the site utilized sporadically over time or for one brief period?

10. What plant and animal remains were used for non-subsistence purposes, e.g. utilitarian, decorative?

11. Are special food processing stations evident at the site?

12. Are special food consumption areas present at the site?

13. How do food resource remains relate to distance to present or past source areas?

14. What potential food resources in the region were not exploited?

15. How do procurement practices relate to human energy expenditures?

16. What are the relative nutritional values of the various food products and how do these values relate to presumed diet?

17. What is the correspondence between recovered food remains and technological remains, and what significance, if any, does this hold?

18. Are there dietary changes reflected in the food/tool remains?

19. What are the implications of food remains with respect to site population and structure?

B. <u>Hypotheses</u>

1. The greatest number of regional sites will be focused on the principal drainages and local zones with the greatest diversity/productivity.

2. Regional inhabitants will make use of most inhabitable rockshelters within Mill Creek Canyon, but at varying levels and times depending on size and proximity to valued natural resources.

3. The Spider Rockshelter represents an intermediate zone of long-term environmental diversity/productivity, but with close proximity to long-term rich zones.

4. Spider Rockshelter represents a secondary activity location to primary sites such as M23 (large rockshelter) and M2 (large open village) nearby.

5. Spider Rockshelter represents a task-specific subsistence oriented base for fall hunting and gathering activities.

6. Spider Rockshelter was utilized by no more than one family at any one time.

7. The flaked and ground stone assemblage will reflect a diverse procurement pattern, both hunting and gathering.

8. The flaked stone assemblage will reflect hunting-butchering-animal processing activities of both large game (e.g. deer) and small game (e.g. rabbits).

9. The ground stone assemblage and micro- and macro-floral remains will reflect both soft vegetal (e.g. acorn) and hard vegetal (e.g. grass seed) processing, with emphasis on the latter through time.

C. Testing Mechanisms

1. Examine regional site records and excavation reports as a comparative base.

2. Map local micro- and macro-environmental factors deemed relevant (catchment analysis) (not accomplished).

3. Excavation of a sample--or levels of samples--to obtain food remains and technology related associations suitable for meaningful analysis.

4. Hearth flotation/recovery. Midden screening (wet) with 1/8".

III. Technology

Late prehistoric/early historic inhabitants of the region utilized a technology oriented toward hunting, gathering/ collecting, processing, and consuming a wide range of wild plants and animals. Families generally manufactured most items needed for their day-to-day life with some craft specialization and acquisition by trade or exchange. Flaked

and ground stone and bone tools and ornaments predominated in the assemblages. Basketry, feather work, etc. were important cultural items and could be recovered if dry deposits occur.

It is known that the bow and arrow replaced the atlatl-dart. It would also appear that hopper mortars were more important earlier than milling slabs. Ceremonial ritual objects were relatively few.

Details of the early historic Southern Yana technology can be found in Waterman (1918) and Sapir and Spier (1943), among others.

A. Research Questions

1. What technologies are expressed at the site?

2. How do these technologies compare with previously identified regional technologies?

3. Are any innovative means of artifact production evident?

4. Are there changes in technology evident over time (stratigraphically)? Are they consistent over time?

5. What items are being produced locally, and which are imports?

6. What are the trajectories of stages of manufacture of flake-stone implements employed at the various sites, and what are the behavioral implications spatially and chronologically for site function, exchange and trade, and stone tool technology?

7. What technological items are missing (perishables) which might be inferred from other items (e.g. hopper mortars, bone awls - baskets; fish bone - weirs, nets; arrow points - arrows, etc.)?

8. Are any perishables evident through dry-deposit preservation, carbonization, etc.?

9. What energy levels (length and intensity of manufacture) are expressed in technological items?

10. How does this energy expenditure factor relate to adaptation efficiency?

11. Does the lithic technology practiced by shelter occupants reflect differential treatment for obsidian and non-obsidian specimens?

B. Hypotheses

1. The site assemblage(s) will be dominated by tools and implements (and their byproducts) related to day-to-day activities with few or no items of ornamental or ceremonial/ritual use.

2. No evidence of change in manufacturing techniques will be evident at the site.

3. The availability and quality of some stone materials influenced the technological processes evident in the site.

4. Utilitarian items requiring little labor in manufacture will exhibit evidence of short-term use.

5. Utilitarian items requiring considerable manufacture time will exhibit long-term (heavy) use.

6. Flaked stone tools are brought to the site in finished form with incidental maintenance and sharpening carried out at the site.

7. Milling tools represent locally available stones not shaped for subsequent use.

8. Lithic technology applied to obsidian differed from that applied to other cryptocrystalline materials (e.g. basalt).

C. Testing Mechanisms

1. Acquire an adequate sample of artifacts through a well-distributed sample of midden with adequate depth/stratigraphic controls.

2. Analyze various artifact categories and establish meaningful typologies based on previous regional work and qualitative and quantitative evaluation of site (artifact) content. Special attention will need to be paid to inferred manufacture processes.

3. Conduct experimental production of artifacts, if deemed appropriate.

IV. Trade/Exchange

The Mill Creek Canyon region seemingly represents a peripheral trade area with respect to northern California as a whole. Ethnographically, some local trade and exchange occurred as between foothill/mountain and Valley groups and between Yana groups themselves on a north to south basis.

A. Research Questions

1. What raw materials or products were obtained from nonlocal sources and what and where are the sources?

2. What groups may have traded with the local (lower Mill Creek) inhabitants? Why?

3. Were trade/exchange systems constant in the canyon region?

4. How do exchange/trade inferences based on data analysis relate to ethnographic patterns and historical events?

5. How do manufacture refuse and artifact frequecies relate to site activities? Are discrepancies explainable by trade/exchange?

B. Hypotheses

1. Trade/exchange (or contact-acquisition) will be evident through the presence of exotic materials or remains from distant or foreign (i.e. European) sources.

2. Trade/exchange of exotic materials will be evident through the presence of finished or near-finished products and little or no manufacture refuse, and perhaps through the presence of certain European goods (i.e. glass beads).

3. Evidence of nonperishable manufactured goods for trade/exchange will not be present (e.g. numerous pestle blanks, basalt preforms, etc).

4. Trade/exchange patterns of obsidian, shell beads, and other items will differ chronologically.

C. Testing Mechanisms

1. Obsidian hydration and sourcing.

2. Sourcing analysis of other potential exotic materials (e.g. pigments, chert, steatite).

3. Analysis of lithic manufacture techniques/refuse--or other material manufacture techniques/refuse--to assess possible blank or tool export-import.

4. Analysis of plant and animal remains for current or past distribution and availability from site.

5. Comparison of tool kit and refuse patterns with other regional excavation results of similarly dated sites.

6. Adequately assess material and artifact types and frequencies by spatial and horizontal distribution.

V. Deposit Formation Processes

The Spider Rockshelter deposit has formed through a combination of natural and cultural processes and has also been subjected to subsequent bioturbation, downslope movement, water absorption and drying, and other events. What effects these various processes have on interpreting site occupation and past environments is an important line of inquiry.

A. Research Questions

1. What factors (anthropogenic and natural) have contributed to the structure and content of the deposit (tied in with soil studies)?

2. How much bioturbation has occurred?

3. Is there evidence of midden/artifact displacement by downslope movement, rain splash, etc.?

4. Is there evidence from the midden to indicate disturbance by subsequent site occupants?

5. What cultural disposal patterns are evident?

6. Has there been natural deposition/erosion at the site?

7. Is there evidence of perishable preservation mechanisms (burning, dry areas, compartmentalization)?

8. Has bedrock, floor, wall, or ceiling disintegration affected the midden?

B. Hypotheses

1. Deposit formation represents an accumulation of downslope soil movement into the end of the shelter, human refuse, disintegration of bedrock, vegetation remnants and animal residues.

2. Human contribution to the deposit is minimal to moderate, at best representing ephemeral activities over a short duration.

3. No post-occupation human intrusions are present.

4. The deposit represents, for the most part, recent activities (post A.D. 1000).

C. Testing Mechanisms

1. Examination of soil/midden content upon excavation for disturbance factors and natural content.

2. Examination of artifact sorting looking for natural (e.g. gravitational movement) as well as cultural factors as based on distribution within excavation levels and in the site in general.

3. Proper recording of representative soil profiles.

4. Accurate surface mapping of site and immediate environs.

5. Definition of anomalies present in the midden (e.g. pits refilled, disposal zones, etc.).

6. Definition of midden contents, natural and cultural, through level observations and soil analysis throughout sampled midden.

7. Careful examination and definition of midden-sterile boundaries, if present.

Further Comments

The research topics, questions, and hypotheses, upon testing, have potential for leading to a greater understanding of the behavior and culture of the site's occupants and, to a lesser extent, regional peoples, depending on site content.

More relevant questions, hypotheses, and testing mechanisms may become apparent with the initiation of excavation.

No doubt some, perhaps many of the questions and hypotheses, will prove unanswerable. This is probably the case in a testing phase. The proposed investigation strategy was a best guess at the time of writing.

In any case, the preparation of the design makes the testing program responsible to the public and to the resource, however complex or simple, and can potentially allow for a greater extraction of the information present.

APPENDIX 2

Braided Object from Payne Cave (after Baumhoff 1957:Fig. 3A3)

Debitage Analysis for Spider Rockshelter, CA-Teh-1432

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Introduction

The collection from Spider Rockshelter (CA-Teh-1432) analyzed for this report was excavated by the Bureau of Land Management in 1984. The site, located within the lower reaches of Mill Creek Canyon, is a small rockshelter dominated by flaked stone and milling-related artifacts. This study focuses on one aspect of the flaked stone assemblage, the debitage, in an attempt to identify the flaking behaviors or patterns which contributed to it's presence at the site. For this study, debitage is defined as unmodified, residual lithic flakes and shatter produced from the reduction of cores or the manufacture of flaked stone tools.

Research Objectives and Analytical Approach

The analysis of the Spider Rockshelter debitage was guided by two objectives:

1) The identification, description, and characterization of the basic types of flaked stone tool behavior at the site.

2) The determination of variability in the use of raw material.

To facilitate these research objectives, the following analytical methods and techniques were employed.

First, the debitage was separated by raw material type and sorted into three generalized reduction categories: (1) percussion reduced thinning flakes, (2) pressure reduced thinning flakes, and (3) biface thinning flakes. Those within the percussion reduced thinning category were further subdivided into classes based on the amount of remnant cortex: primary, secondary and tertiary flakes.

The analysis of debitage from each of the four categories centered on monitoring specific technological attributes of complete or platform bearing specimens. These included dorsal scar pattern, platform type, length, width, thickness and weight. This method, referred to as attribute analysis (cf. Binford and Quimby 1963; Frison and Bradley 1980), provides integral data for the identification of core reduction/tool production trajectories of a flaked stone tool assemblage. These data can be used to identify the overall patterns of lithic technology evident at a site, thus imparting a better understanding of human behavior and cultural processes in general. The data provided below incorporate the results of the technological investigation and are presented on a descriptive level of analysis.

Results

Debitage constitutes the single largest artifact category present at Spider Rockshelter, accounting for 89% of the collection. Equally, it is the most dominant artifact type within the flaked stone tool assemblage. A total of 351 individual pieces was recovered from the three excavation units.

Basalt dominates the debitage from Spider Rockshelter, accounting for 61.2% of the collection. As shown in Table 1, however, obsidian (34.2%), cryptocrystalline silicates (4.0%), and quartz (0.6%) were also used. Basalt is a locally derived material source, being found in the Mill Creek drainage and at the monolith of Black Rock, 17 miles easterly where a quarry has been identified (cf. Johnson and Wiant 1976). In contrast, obsidian, cryptocrystalline silicates, and quartz are not indigenous to the Mill Creek area, indicating procurement through either travel or trade. Visual characterization of the obsidian debitage suggests that most is derived from Tuscan glass, although some are similar to the readily distinguishable Kelly Mountain source which is ridden with phenocrystic inclusions. The cryptocrystalline silicate pieces in the collection are predominately of white chert similar to that found in Lassen Volcanic Park (cf. Johnson 1975).

The distribution of raw material types within the excavated units is comparable throughout the site, with the exception of Unit One (Table 2). Here, obsidian predominates 1.5:1 over basalt and 6.5:1 over cryptocrystalline silicates. Within Units Two and Three, however, basalt is the most common flaked stone material dominating over obsidian 7:1 and 9:1, respectively. Two factors, both depositional and non-depositional may account for these differences. First, it is possible that various parts of the rockshelter were used for task specific activities dominated by a particular raw material toolstone. Unit One and it's surrounding area are situated at the rear of the rockshelter and may have been favored over the location of Units Two and Three at the dripline and apron of the shelter for particular tasks involving obsidian reduction. Second, the recovery technique employed at the site included water screening which may have biased the collection of larger basalt flakes over smaller obsidian ones from within a matrix which was not completely dried due to cold winter conditions(Personal Communication 1986: Eric Ritter).

Limited reductive activities were employed at Spider Rockshelter regardless of the toolstone being used. Percussion thinning was the dominant focus of flintknapping and was excercised on all raw materials. As shown in Table 3, primary decortication occurred infrequently (5.1%) and was used in relatively similar proportions on both basalt and obsidian toolstone. Secondary decortication efforts were more common (14.4%), being employed in almost equal numbers on basalt and obsidian. Tertiary staged thinning flakes predominate the rockshelter's debitage collection (77.1%), both overall and within each raw material type. Pressure reduced

flakes and biface thinning flakes are minimally present (2.5% and 0.9%, respectively) and occur solely on obsidian toolstone. Evidence of bipolar reduction is absent from the collection.

Dorsal scar patterns indicate the exploitation of various platform surfaces (Table 4). Although unidirectional platform scars predominate within all toolstone groupings, perpendicular, multiple and diagonal orientations are also present. The reduction of basalt appears to have occurred mainly from a unidirectionally oriented platform (75.4%), suggesting reduction from a core sufficiently shaped for the controlled removal of subsequent blanks. The use of a single platform reduction strategy suggests that platforms were being used sequentially, with one being fully exploited before the core was rotated and another employed. This implies a systematic method of reduction, and one able to produce regularized blanks. Obsidian, however, exhibits a multiplicity of dorsal scar patterns suggesting repeated movement of the objective piece and the exploitation of several platforms. This technique allows for the maximum use of a raw material, but sacrifices the removal of systematically patterned blanks.

Basalt detritus, regardless of reduction stage, is significantly larger in size than obsidian or cryptocrystalline silicates as demonstrated in Table 5. These data indicate that parent blocks of basalt selected for modification were larger than those of other toolstone, a fact which is undoubtedly related to it's local availability.

Conclusions

Two flaking techniques were identified in the debitage collection from Spider Rockshelter. The first, and most dominant, is the direct free-hand percussion technique evidenced primarily by thinning flakes of basalt, obsidian, cryptocrystalline silicates and quartz. This method was applied during various reductive stages including primary and secondary decortication and thinning. Although rare, pressure flaking is evident among the collection, but unlike percussion thinning, it is restricted to the latter stages of tool production or rejuvenation activities of obsidian artifacts.

Based on the analysis and interpretation of these limited data, it is apparent that flaked stone tool activities occurring at Spider Rockshelter focused primarily on artifact thinning, maintenance, resharpening or rejuvenation activities of basalt, obsidian, and cryptocrystalline silicate toolstone. Although some indication of primary reduction and initial shaping is evident by the presence of cortical debitage, these activities are rare, and appear to be occasional efforts and not a major focus of flintknapping at the site.

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1975 Archeological Investigations in and around Lassen Volcanic National Park in 1975. Report on File with the U.S. Department of the Interior, National Park Service, Western Regional Office, Tucson.

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1976 An Archaeological Reconnaissance in Portions of the Mill and Deer Creek Canyon located within the Almanor District of Lassen National Forest, California. Report on File with the U.S. Department of Agriculture, Forest Service, Region 5, San Francisco.

TABLE 1

DEBITAGE RAW MATERIAL TYPE BY UNIT

RAW MATERIAL

Unit	Basalt		Obsidian		CCS		Quartz		Row Total	
	n	%	n	%	n	%	n	%	n	%
1	66	39.5	100	60.0	1	9.1	-	-	167	100.0
2	122	80.8	17	11.3	10	6.6	2	1.3	151	100.0
3	27	81.8	3	9.1	3	9.1	-	-	33	100.0
Column Total	215	61.2	120	34.2	14	4.0	2	0.6	351	100.0

TABLE 2

ABSOLUTE FREQUENCIES OF COMPLETE AND PLATFORM BEARING FLAKES
BY MATERIAL, REDUCTION STAGE, UNIT AND LEVEL

MATERIAL AND REDUCTION STAGE

	BASALT				OBSIDIAN						CCS	
Unit	P	S	T	RT	P	S	T	Pr	B	RT	T	RT
UNIT 1:												
0-10	-	1	11	12	1	3	10	2	1	17	-	0
10-20	-	1	3	4	1	2	11	1	-	15	-	0
Total	0	2	14	16	2	5	21	3	1	32	0	0
UNIT 2:												
0-10	4	4	13	21	-	1	7	-	-	8	5	5
10-20	-	1	7	8	-	-	-	-	-	0	1	1
20-30	-	2	2	4	-	-	-	-	-	0	-	0
30-40	-	-	5	5	-	1	-	-	-	1	1	1
Total	4	7	27	38	-	2	7	-	-	9	7	7
UNIT 3:												
0-10	-	1	10	11	-	-	-	-	-	0	5	5
10-20	-	-	4	4	-	-	-	-	-	0	-	0
Total	-	1	14	15	-	-	-	-	-	0	5	5

P = Primary Decortication Flakes
S = Secondary Decortication Flakes
T = Thinning Flakes
Pr = Pressure Flakes
B = Biface Thinning Flakes
RT = Row Total
CCS = Cryptocrystalline Silicates

TABLE 3

FREQUENCIES OF COMPLETE AND PLATFORM BEARING DEBITAGE
BY REDUCTION STAGE AND RAW MATERIAL

REDUCTION STAGE

Material	Primary Decortication		Secondary Decortication		Tertiary		Pressure		BTF		Row Totals	
	n	%	n	%	n	%	n	%	n	%	n	%
Basalt	4	5.8	10	14.5	55	79.7	-	-	-	-	69	100.0
Obsidian	2	4.9	7	17.1	28	68.3	3	7.3	1	2.4	41	100.0
CCS/Qz	-	-	-	-	8	100.0	-	-	-	-	8	100.0
Column Totals	6	5.1	17	14.4	91	77.1	3	2.5	1	0.9	118	100.0

CCS/Qz = Cryptocrystalline silicates/Quartz

BTF = Biface Thinning Flakes

TABLE 4

DORSAL SCAR PATTERN FOR COMPLETE AND PLATFORM BEARING DEBITAGE

REDUCTION STAGE

Mat	Single Platform n	Single Platform %	Opposed Platform n	Opposed Platform %	Crossed Platform n	Crossed Platform %	Multiple Platform n	Multiple Platform %	Diagonal Platform n	Diagonal Platform %	Uniden-tifiable n	Uniden-tifiable %	Cortex Platform n	Cortex Platform %	Row Total n	Row Total %
Bas	52	75.4	-	-	5	7.2	2	3.0	3	4.3	4	5.8	3	4.3	69	58.5
Obs	23	56.0	2	4.9	6	14.6	5	12.2	3	7.3	-	-	2	4.9	41	34.8
CCS	7	87.5	-	-	1	12.5	-	-	-	-	-	-	-	-	8	6.8
Column Totals	82	69.5	2	1.7	12	10.2	7	5.9	6	5.1	4	3.4	5	4.2	118	100.0

Mat = Raw Material Type
Bas = Basalt
Obs = Obsidian
CCS = Cryptocrystalline silicates

TABLE 5

SIZE DIMENSIONS FOR DEBITAGE BY REDUCTION STAGE AND RAW MATERIAL

Primary and Secondary Decortication

Basalt	$\bar{x}$	s.d.	min	max	N
Length (mm)	36.78	17.38	15.8	52.7	10
Width (mm)	29.07	11.28	13.1	44.9	10
Thickness (mm)	8.81	7.05	3.5	22.7	10

Obsidian	$\bar{x}$	s.d.	min	max	N
Length (mm)	9.25	3.90	7.0	10.4	6
Width (mm)	8.3	3.06	3.4	11.3	6
Thickness (mm)	1.76	0.89	0.9	3.5	6

Tertiary Thinning Flakes

Basalt	x	s.d.	min	max	N
Length (mm)	25.52	16.71	7.1	55.6	40
Width (mm)	24.4	13.24	6.0	55.1	40
Thickness (mm)	5.35	4.23	0.5	16.5	40

Obsidian	x	s.d.	min	max	N
Length (mm)	8.06	2.25	4.1	11.0	9
Width (mm)	5.94	1.62	3.5	7.9	9
Thickness (mm)	1.05	0.39	0.6	1.8	9

APPENDIX 3

Deer Splint Awl from Payne Cave (after Baumhoff 1957: Fig. 2q)

Sonoma State University
Academic Foundation, Inc.

ANTHROPOLOGICAL STUDIES CENTER
CULTURAL RESOURCES FACILITY
707 664-2381

6/26/85

Dr. Eric W. Ritter
Archaeologist
Bureau of Land Management
355 Hemstead Drive
Redding, CA 96002

Eric:

This letter is being written to report upon the analysis of the mammal bones from Spider Rockshelter (CA-TEH-1432). This investigation was conducted pursuant to U.S.D.I. Bureau of Land Management Purchase Order No. CA-050-PH5-69 of 2/13/85, which was contracted with the Sonoma State University Academic Foundation. A copy of this purchase order has been enclosed with this letter.

Also enclosed are three copies of the tables detailing the results of my analysis of the mammal bones from Spider Rockshelter. One table lists the total number of identified bones and minimum number of individuals representing each mammalian taxa, while the other presents this data with respect to its provenience and the nature of the skeletal elements which were encountered. A total of 18 identified bones from at least three individuals representing four mammalian taxa were observed. All of these taxa are present in the immediate vicinity of the site today, and would have been present prehistorically. No signs of cultural modification were noted on any of the mammal bones from Spider Rockshelter. Several pieces of possible human bone were found in the faunal sample, including one human incisor. These have been bagged and labeled separately.

All of the faunal remains from Spider Rockshelter will be returned to you in a shipment from U.S.P.S. sometime during the week of July 1-5, 1985. If you have any questions concerning my analysis of the faunal remains from Spider Rockshelter, please give me a call or drop me a line. Take care.

Sincerely yours,

Dwight

Dwight D. Simons
Senior Zooarchaeologist

1801 East Cotati Avenue Rohnert Park, California 94928

MAMMAL REMAINS FROM CA-TEH-1432

Mammalian Taxa	No. of Bones	Min. No. of Indiv.
California Ground Squirrel (*Otospermophilus beecheyi*):	7	1
Pocket Gopher (*Thomomys bottae*):	2	1
Deer/Pronghorn/Sheep-Goat (Artiodactyla):	8	
Mule Deer (Odocoileus hemionus):	1	1
TOTAL MAMMAL REMAINS	18	3

DATA ON MAMMAL REMAINS FROM CA-TEH-1432

1. California Ground Squirrel (*Otospermophilus beecheyi*):

Provenience	Material(s)
Unit 2, 0-10 cm., 1/4 Unit, Wet Screen.	Left mandible with incisor and 3 premolars and molars.
Unit 2, 10-20 cm., 1/4 Unit, Wet Screen.	Left astragalus.
Unit 2, 20-30 cm., Wet Screen.	Distal right tibia.

2. Pocket Gopher (*Thomomys bottae*):

Provenience	Material(s)
Unit 3, 0-10 cm., Base of NE 1/4, 1/4 Unit, Wet Screen.	Right mandible with incisor.

3. Deer/Pronghorn/Sheep-Goat (Artiodactyla):

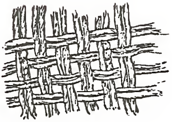
Provenience	Material(s)
Unit 1, 0-10 cm., Not Wet Screened.	Two molar tooth fragments.
Unit 1, 0-10 cm., 1/4 Unit, Wet Screen.	Four molar tooth fragments.
Unit 2, 0-10 cm.	Proximal first phalanx.
Unit 2, 0-10 cm., 1/4 Unit, Wet Screen.	Distal metapodial fragment.

4. Mule Deer (*Odocoileus hemionus*):

Provenience	Material(s)
Unit 2, 30-40 cm., Wet Screen.	Fragment, right mandible.

Bone Awl from Payne Cave (after Baumhoff 1957: Fig. 2u)

APPENDIX 4



1/1

Matting of Single Strand Cordage from Payne Cave
(after Baumhoff 1957: Fig. 3A4)

Sonoma State University
Academic Foundation, Inc.

ANTHROPOLOGICAL STUDIES CENTER
CULTURAL RESOURCES FACILITY
707 664-2381

June 11, 1985

Eric Ritter
Bureau of Land Management
355 Hemstead Drive
Redding, California 96002

Dear Eric:

This letter reports the results of hydration analysis of nine obsidian artifacts from CA-TEH-1432. This hydration work was completed pursuant to Purchase Order CA-050-PH5-69 (Requisition # CA-050-RQ5-33) issued to the Sonoma State University Academic Foundation Inc. by the Ukiah District Office of the Bureau of Land Management on behalf of the Bureau's Redding Office.

Small samples taken from the specimens were subjected to thin-section preparation and hydration measurement at the Obsidian Hydration Laboratory, an adjunct of the Anthropological Studies Center at Sonoma State University. The procedures used by this lab for thinsection preparation and hydration band measurement are described below.

Each specimen was examined in order to find 2 or more surfaces that would yield edges which would be perpendicular to the microslide when preparation of the thinsection was completed. Two small parallel cuts were made at an appropriate location along the edge of the specimen with a 4" diameter circular saw blade mounted on a lapidary trimsaw. The cuts resulted in the isolation of a roughly triangular shaped sample with a thickness of approximately 1 to 2 millimeters. The isolated sample was removed from the specimen and mounted with Lakeside cement to a prenumbered petrographic microslide.

Reduction of the thickness of each sample was accomplished by manual grinding with #600 silicon carbide abrasive on a water-moistened glass plate. The grinding process was completed in two steps. The first grinding was terminated when the sample's thickness was reduced by approximately 2/5, thus eliminating micro-chips caused by the saw blade during the cutting process. Each slide was reheated, the Lakeside cement softened, and the sample inverted. The newly exposed surface was ground until a final thickness of 30 to 50 microns was attained.

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The final thickness of each thinsection was determined by the "touch" technique, whereby a finger was run across the slide and on to the sample. Each sample's thickness was determined by feel. The second technique employed for arriving at the proper thinsection thickness is termed the "transparency" test. Each microslide was held against a strong source of light and the translucency of the thinsection observed. Each sample was considered sufficiently reduced when the thinsection readily allowed the passage of light. When the grinding process was completed, a protective glass coverslip was affixed over each thinsection with mounting media. The completed microslides are on file at the Obsidian Hydration Lab under Job Number 85-H405.

Hydration bands were measured with a 45 power objective mounted on an American Optical petrographic microscope equiped with a Bausch and Lomb 12.5 power filar micrometer eyepiece. Six measurements were taken at several locations along the edge of each thinsection and the average of the measurements was calculated and included on the enclosed table.

Note, 2 specimens exhibited no visible hydration bands. They appeared very dense and grainy under the microscope and might not be obsidian (this was true especially of specimen 214-3).

The specimens have been forwarded to Richard Hughes for source analysis. I do not know what Richard's schedule is so I don't know when he will get the specimens analyzed. However, if you have questions about the hydration, please do not hesitate to contact me.

Cordially,

Thomas M. Origer, Coordinator
Obsidian Hydration Laboratory

enclosure

CA-TEH-1432 Submitted by: Eric Ritter - BLM June 1985

Lab#	Cat.#	Description	Provenience	Remarks	Readings	Mean	Source
01	214-28	stemmed/cn frag	2/0-10	none	3.0 3.0 3.2 3.2 3.2 3.2	3.1	Kelly Mt.
02	214-29	flake	2/0-10	none	0.9 1.0 1.0 1.1 1.1 1.1	1.0	Tuscan
03	214-31	cn point frag	2/0-10	nvb			
04	214-45	arrow point frag	2/0-10	fb	1.3 1.3 1.3 1.4 1.4 1.4	1.4	Tuscan
05	214-1	contract stem frag	1/0-10	none	2.1 2.1 2.2 2.2 2.3 2.3	2.2	
06	214-2	cn point frag	1/0-10	none	1.0 1.0 1.0 1.0 1.0 1.0	1.0	
07	214-3	cont stem frag	1/0-10	nvb			Ukn.--not obs?
08	214-76	lg cn point frag	3/0-10	none	7.7 7.7 7.8 7.9 7.9 8.0	7.8	Kelly Mt.
09	none	flake w/cortex	3/10-20	none	0.9 1.0 1.0 1.0 1.0 1.0	1.0	Tuscan

Lab Accession No.: 85-H405 Technician: Thomas Origer

Sonoma State University Academic Foundation, Inc.

ANTHROPOLOGICAL STUDIES CENTER
CULTURAL RESOURCES FACILITY
707 664-2381

Dr. Eric Ritter, Archaeologist
Redding Resource Area
Bureau of Land Management
355 Hemsted Drive
Redding, California 96002

November 17, 1986

Dear Eric:

This letter reports hydration band measurements for obsidian specimens from two sites situated within the Redding Resource Area, Ukiah District, Bureau of Land Management. Included in this analysis were specimens obtained from site CA-SHA-1544 (n=14) and CA-TEH-1432 (n=3) situated in Shasta and Tehama Counties, respectively. A total of 17 specimens was subjected to hydration analysis at the Hydration Lab, Sonoma State University. This hydration work was completed pursuant to BLM Purchase Order CA-050-PH6-156 following source (XRF) analysis by Dr. Richard E. Hughes, also affiliated with Sonoma State University's Anthropological Studies Center.

Small samples were removed from the specimens and subjected to thinsection preparation and hydration measurement at the Obsidian Hydration Laboratory, an adjunct of the Anthropological Studies Center, Sonoma State University. Procedures used by this lab for thinsection preparation and hydration band measurement are described below.

Each specimen was examined in order to find two or more surfaces that would yield edges which would be perpendicular to the microslide when preparation of the thinsection was completed. Generally, two small parallel cuts were made at an appropriate location along the edge of each specimen with a four inch diameter circular saw blade mounted on a lapidary trimsaw. The cuts resulted in the isolation of small samples with thicknesses of approximately one millimeter. The samples were removed from the specimens and mounted with Lakeside Cement to prenumbered petrographic microslides.

The thickness of each sample was reduced by manual grinding with a slurry of #500 silicon carbide abrasive on a glass plate. The grinding was completed in two steps. The first grinding was terminated when the sample's thickness was reduced by approximately 1/2, thus eliminating micro-chips created by the saw blade during the cutting process. Each slide was then reheated, which liquified the Lakeside Cement, and the samples inverted. The newly exposed surface was then ground until a final thickness of 30 to 50 microns was attained.

The final thickness of each thinsection was determined by the "touch" technique, whereby a finger was run across the slide, onto the sample, and the sample's thickness determined by feel. The second technique employed for arriving at proper thinsection thickness is termed the "transparency" test.

1801 East Cotati Avenue Rohnert Park, California 94928

Each microslide was held against a strong source of light and the translucency of the thinsection observed. Each sample was considered sufficiently reduced in thickness when the thinsection readily allowed the passage of light. When all grinding was completed, a coverslip was affixed over each thinsection. The completed microslides are stored at the Sonoma State University Obsidian Hydration Lab under Job File Number 86-H508.

All hydration bands were measured with a 45 power objective on an American Optical petrographic microscope equiped with a Bausch and Lomb 12.5 power filar micrometer eyepiece. Six measurements were taken at several locations along the edges of each thinsection and the mean of the measurements was calculated and included on the enclosed tables. Source assignments included on the tables were made by Richard Hughes who completed XRF source analysis pursuant to Purchase Order CA-050-PH6-156.

I hope that these hydration measurements are useful in your research. If you have any questions concerning the hydration results, do not hesitate to contact me.

Cordially,

Tom Origer

Thomas M. Origer, Coordinator
Obsidian Hydration Laboratory

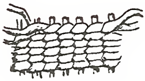
enclosures

CA-TEH-1432 Submitted by: Eric Ritter - BLM November 1986

Lab#	Catalog #	Description	Provenience	Remarks	Readings	Mean	Source
01	214-12	flake	1/0-10	1st band	3.7 3.7 3.8 3.8 4.1 4.1	3.9	T
01	214-12	flake	1/0-10	2nd band	6.6 6.6 6.7 6.7 6.7 6.7	6.7	T
02	214-43	flake	2/0-10	none	1.2 1.3 1.4 1.4 1.4 1.4	1.4	T
03	214-82	flake	3/10-20	none	2.7 2.7 2.9 2.9 2.9 2.9	2.8	T

Lab Accession No.: 86-H508 Technician: Thomas M. Origer

APPENDIX 5



1/1

Twined Basketry Fragment from Payne Cave (after Baumhoff 1957: Fig. 3A5)

June 25, 1985

Dr. Eric W. Ritter
Archaeologist
Bureau of Land Management
355 Hemstead Drive
Redding, CA 96002

Dear Eric:

Enclosed please find a xerox copy of a data sheet presenting the results of x-ray fluorescence analysis of six obsidian artifacts from Spider Rockshelter (CA-Teh-1432), Tehama County, California. This analysis was conducted pursuant to U.S.D.I., Bureau of Land Management Purchase Order No. CA-050-PH5-69 (dated February 13, 1985) under Sonoma State University Academic Foundation, Inc. Account 6081-A1, Job X85-19.

Laboratory investigations were conducted at the Department of Geology and Geophysics, University of California, Berkeley, on a Spectrace™ 440 (United Scientific Corporation) energy dispersive x-ray fluorescence machine equipped with a 572 power supply (50 kV, 1 mA), 534-1 pulsed tube control, 514 pulse processor (amplifier), 588 bias/protection module, Tracor Norther 1221 100 mHz analog to digital converter (ADC), Tracor Northern 2000 computer based analyzer, an Rh x-ray tube and a Si(Li) solid state detector with 142 eV resolution (FWHM) at 5.9 keV in a 30 mm^2 area. The x-ray tube was operated at 30.0 kV, .40 mA pulsed, with a .04 mm Rh primary beam filter in an air path at 200 seconds livetime. All trace element measurements on the enclosed data sheet are expressed in parts per million (ppm) by weight, and these were compared directly to values for obsidian sources that appear in Robert N. Jack (1976), "Prehistoric Obsidian in California I: Geochemical Aspects", pp. 183-217 in R.E. Taylor (ed.), Advances in Obsidian Glass Studies: Archaeological and Geochemical Perspectives, Noyes Press, Park Ridge, New Jersey, and Richard E. Hughes (1983), "Exploring Diachronic Variability in Obsidian Procurement Patterns in Northeast California and Southcentral Oregon: Geochemical Characterization of Obsidian Sources and Projectile Points by Energy Dispersive X-ray Fluorescence", Ph.D. Dissertation, Department of Anthropology, University of California, Davis. Geographic locations for all obsidian sources appear on maps 3-9 in my dissertation. The ± character associated with each trace element concentration value on the data sheets represents counting error uncertainty at 200 seconds livetime.

Source assignments were made on the basis of comparison of diagnostic trace element concentration values (Rb, Sr, Y and Zr) for artifacts with values for known obsidian sources. The results of these analyses can be summarized as follows.

June 25, 1985

Of six specimens submitted for analysis, three (Cat. nos. U1-10/20, 214-29 and 214-45) were manufactured from volcanic glass of the Tuscan geochemical type, and one artifact (Cat. no. 214-3) yielded trace element concentrations unlike any obsidian known to me; this latter specimen may not be a natural volcanic glass. The remaining two specimens (Cat. nos. 214-28 and 214-76) possess Rb, Sr and Zr trace element concentrations similar to Grasshopper Flat/Lost Iron Well/Red Switchback and Kelly Mountain obsidian (cf. Hughes 1983: Tables 2-6 and 2-8). However, Fe/Mn ratios generated for these two specimens (214-28= 79.8; 214-76= 79.7) clearly show that both of them were fashioned from obsidian of the Kelly Mountain geochemical type (see Hughes 1983: Figure 3-5).

I hope this information will help in your analysis of these site materials. Please contact me if I can be of further assistance.

Sincerely,

Richard

Richard E. Hughes, Ph.D.
Senior Research Archaeologist
Anthropological Studies Center
Sonoma State University
Rohnert Park, CA 94928

CA-Teh-1432
6-15-85
R.E. HUGHES

(P/C CONC (PPM))
(PPM ST DEV)

CAT. No.	CHSQ	PB	TH	RB	SR	Y	ZR	NB
214-76	8.7	37.9 +- 2.0	17.4 +- 3.7	155.9 +- 3.0	57.1 +- 2.3	29.8 +- 2.5	199.4 +- 3.1	16.7 +- 1.9
#1-10/20	6.5	22.2 +- 2.0	12.2 +- 4.0	91.6 +- 2.9	93.7 +- 3.0	19.7 +- 2.7	94.1 +- 2.9	12.1 +- 2.2
214-29	6.4	20.3 +- 2.2	13.9 +- 4.5	81.8 +- 3.1	87.8 +- 3.3	20.9 +- 3.0	80.9 +- 3.2	13.3 +- 2.5
214-28	7.8	37.0 +- 2.3	23.6 +- 4.2	149.0 +- 3.3	57.4 +- 2.6	29.4 +- 2.8	196.3 +- 3.5	13.0 +- 2.2
214-45	6.6	21.8 +- 2.2	10.0 +- 4.5	86.0 +- 3.2	72.1 +- 3.2	18.6 +- 3.1	79.8 +- 3.1	0.0 +- 0.0
214-3	7.2	22.8 +- 3.1	0.0 +- 0.0	33.6 +- 3.5	243.2 +- 6.5	35.9 +- 4.4	158.1 +- 5.4	13.9 +- 3.4

Sonoma State University Academic Foundation, Inc.

ANTHROPOLOGICAL STUDIES CENTER
CULTURAL RESOURCES FACILITY
707 664-2381

October 7, 1986

Dr. Eric W. Ritter
U.S.D.I., Bureau of Land Management
Redding District Office
355 Hemsted Drive
Redding, CA 96002

Dear Eric:

Enclosed please find a xerox copy of a summary sheet presenting x-ray fluorescence data generated from the analysis of fourteen obsidian artifacts from CA-Sha-1544 (n=11) and CA-Teh-1432 (n=3), Shasta and Tehama Counties, California. These analyses were conducted pursuant to U.S.D.I., Bureau of Land Management, Purchase Order No. CA-050-PH6-156 (as amended July 25, 1986), under Sonoma State University Academic Foundation, Inc. Account 6081, Job X86-49.

Laboratory analyses were performed on a Spectrace™ 5000 (Tracor X-ray) energy dispersive x-ray fluorescence spectrometer equipped with a Rh x-ray tube, a 50 kV x-ray generator, 1251 pulse processor (amplifier), 1236 bias/protection module, a 100 mHz analog to digital converter (ADC) with automated energy calibration, and a Si(Li) solid state detector with 150 eV resolution (FWHM) at 5.9 keV in a 30 mm^2 area. The x-ray tube was operated at 30.0 kV, .30 mA, using a .127 mm Rh primary beam filter in an air path at 200 seconds livetime to generate quantitative data for elements Zn - Nb. Data processing for all analytical subroutines is executed by a Hewlett Packard Vectra™ microcomputer with 640K RAM; operating software and analytical results are stored on a Hewlett Packard 20 megabyte fixed disk. Trace element concentrations were computed from a linear least-squares calibration curve established from analysis of 25 international rock standards certified by the U.S. Geological Survey, the U.S. National Bureau of Standards, the Geological Survey of Japan, and the Centre de Recherches Petrographiques et Geochimiques (France). All trace element values on the enclosed summary sheet are expressed in quantitative units (i.e. parts per million [ppm] by weight), and these were compared directly to values for known obsidian sources that appear in Jack and Carmichael (1969), Jack (1976) and Hughes (1986). The locations of all sources identified in the Sha-1544 and Teh-1432 assemblages appear in Hughes (1986: Maps 3-9).

Diagnostic trace element concentration values (i.e., ppm values for Rb, Sr, Y and Zr) generated for these fourteen obsidian artifacts were compared to those from known obsidian sources. I will summarize the results by site.

October 7, 1986

Of eleven specimens analyzed from Sha-1544, eight artifacts (Cat. nos. 97-31, -148, -149, -260, -265, -269, -277 and -283) match the trace element configuration of Tuscan volcanic glass, while three specimens (Cat. nos. 97-233, -253 and -284) correspond with the fingerprint of obsidian of the Grasshopper Flat/Lost Iron Well/Red Switchback geochemical type (designated as "GF/LIW/RS" on the data summary sheet).

All three specimens analyzed from Teh-1432 (Cat. nos. 214-12, -43, and -82) were fashioned from Tuscan volcanic glass.

I hope this information will help in your analysis of these site materials. As you requested, I will forward the artifacts to Tom Origer for obsidian hydration analysis.

Sincerely,

Richard Hughes

Richard E. Hughes, Ph.D.
Senior Research Archaeologist

References

Hughes, Richard E.
1986 Diachronic Variability in Obsidian Procurement Patterns in Northeastern California and Southcentral Oregon. University of California Publications in Anthropology, Vol. 17.

Jack, Robert N.
1976 Prehistoric Obsidian in California I: Geochemical Aspects. In R.E. Taylor (ed.), Advances in Obsidian Glass Studies: Archaeological and Geochemical Perspectives, pp. 183-217. Noyes Press, Park Ridge, New Jersey.

Jack, R.N. and I.S.E. Carmichael
1969 The Chemical 'Fingerprinting' of Acid Volcanic Rocks. California Division of Mines and Geology, Special Report 100: 17-32.

Specimen Number	Trace Element Concentrations							Obsidian Source
	Zn*	Ga*	Rb*	Sr*	Y*	Zr*	Nb*	
97-31	46.1 ±9.1	18.7 ±4.6	85.1 ±5.1	89.7 ±3.1	18.4 ±2.4	64.4 ±4.2	8.2 ±3.5	TUSCAN
97-148	51.2 ±9.5	16.9 ±5.0	88.9 ±5.2	80.1 ±3.1	19.9 ±2.4	61.8 ±4.2	8.9 ±3.6	TUSCAN
97-149	59.5 ±9.2	18.5 ±5.0	81.1 ±5.2	91.0 ±3.3	18.8 ±2.6	67.8 ±4.4	7.6 ±3.8	TUSCAN
97-233	43.6 ±10.3	20.2 ±4.4	136.0 ±5.4	73.1 ±3.1	25.1 ±2.5	175.1 ±4.7	15.6 ±3.5	GF/LIW/RS
97-253	52.2 ±8.3	16.2 ±4.8	145.5 ±5.3	74.1 ±3.1	29.2 ±2.4	191.4 ±4.7	11.4 ±3.5	GF/LIW/RS
97-260	43.0 ±10.1	17.7 ±4.5	83.6 ±5.1	85.3 ±3.2	20.6 ±2.4	68.6 ±4.3	4 7 ±3.9	TUSCAN
97-265	53.8 ±7.5	18.5 ±4.0	86.3 ±5.1	80.8 ±3.0	20.4 ±2.3	68.0 ±4.1	11.4 ±3.4	TUSCAN
97-269	59.3 ±8.1	15.5 ±5.2	94.3 ±5.2	93.5 ±3.2	17.2 ±2.6	65.0 ±4.3	5.2 ±3.8	TUSCAN
97-277	54.4 ±8.8	18.4 ±4.5	91.0 ±5.2	98.3 ±3.3	16.0 ±2.7	57.9 ±4.3	11.4 ±3.6	TUSCAN
97-283	46.8 ±8.9	13.3 ±6.2	99.4 ±5.2	82.5 ±3.1	21.4 ±2.4	72.6 ±4.2	10.7 ±3.5	TUSCAN
97-284	49.1 ±9.8	19.0 ±4.6	125.7 ±5.4	68.0 ±3.2	27.8 ±2.5	179.4 ±4.8	13.2 ±3.6	GF/LIW/RS
214-12	55.4 ±9.7	13.8 ±6.8	107.8 ±5.4	81.7 ±3.4	16.6 ±2.9	75.0 ±4.5	8.9 ±3.8	TUSCAN
214-43	48.8 ±9.3	18.0 ±4.8	93.3 ±5.3	82.4 ±3.3	19.7 ±2.6	71.2 ±4.4	12.9 ±3.7	TUSCAN
214-82	51.5 ±9.9	21.7 ±4.3	97.3 ±5.3	102.0 ±3.4	17.3 ±2.8	71.7 ±4.4	7.9 ±3.8	TUSCAN

* All trace element values in parts per million (ppm).
± Counting error and fitting error uncertainty at 200 seconds livetime.

APPENDIX 6

HISTORIC ARTIFACTS FROM A YAHI VILLAGE IN LOWER MILL CREEK CANYON

Eric W. Ritter

Two historic artifacts were found on the surface of an aboriginal village (temporary BLM number CA-030-217) located along Mill Creek across the canyon from the Spider Rockshelter. The unusual character (modification) of these artifacts and their discovery at an Indian village warrant mentioning.

The first artifact is a 14-inch long, 2-1/2 inch wide rim section from a gray, enameled wash pan originally approximately 14 inches in diameter and 2 inches maximum in height (Fig. 11). The artifact has a rolled rim and appears to have been cut with a metal device leaving a sharp edge which is straight in plan but somewhat sinuous in side-view. The artifact has lost much of the enamel coating and exhibits some rusting. This limits the examination for use marks and wear. The edge has a slight polished appearance. It appears that this modified Euro-American artifact could have served a cutting function, perhaps even harvesting grass and other small stalk plants, due to its almost scythe-like appearance.

The second artifact represents a substantial portion of a metal tool sharpening grindstone wheel manufactured from sandstone (Fig. 12). This wheel was originally about eight inches in diameter with a square central hole two inches on a side. The rim of this 2-1/4 inch wide wheel is slightly concave.

The significant aspect of this artifact is the presence of about six shallow grooves on one side of the wheel (Fig. 12). These appear to be the result of aboriginal tool sharpening, such as for bone awl tips.

Historic artifacts were readily available to the Yana, from clutter along the Lassen Trail or homesteaders' garbage (or goods). The Yana undoubtedly took advantage of available Euro-American goods, these two items probably being examples. A third historic artifact from the site, a long metal rod, was not collected. It must be noted, however, that ranching-homesteading use of the canyon after virtual abandonment by the Yahi resulted in historic litter over a wide area.

FIGURE 11

217-1 Cut rim section of gray enamel ware pan possibly used by the Yahi in cutting functions.

Fig.11

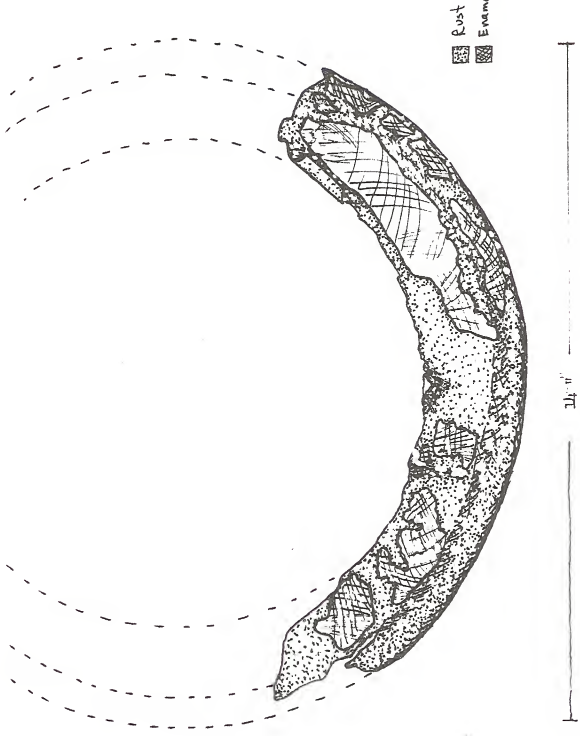
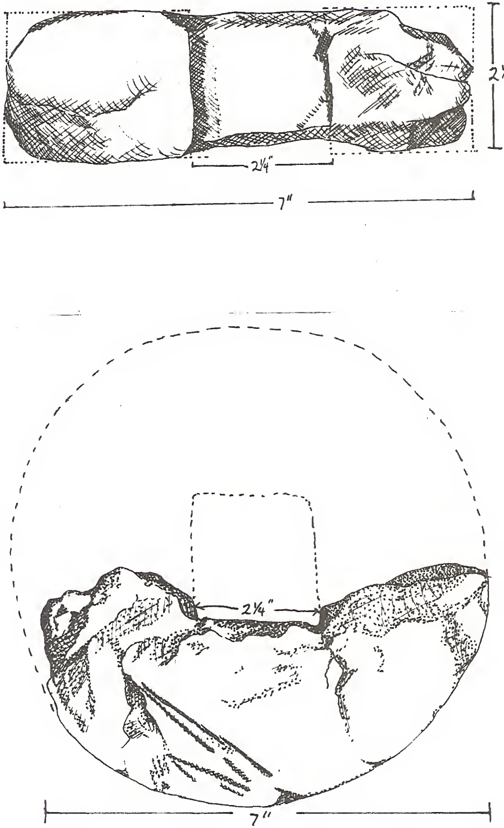


FIGURE 12

217-2 Two views of broken mill wheel exhibiting striations from aboriginal tool sharpening on side.

Fig. 12



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